Project no. 314277

STEEP PROJECT

Systems Thinking for Comprehensive City Efficient Energy Planning

Seventh Framework Programme

Theme Energy

D1.1 Collection of Best Practices

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PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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1. INTRODUCTION

1.1 Collection of Best Practices

This project called STEEP (SYSTEMS THINKING FOR COMPREHENSIVE CITY EFFICIENT ENERGY PLANNING is presented under the FP7-ENERGY-SMARTCITIES-2012 call. This is the first Deliverable document of the project in its WP1. The purpose of this Deliverable is to explain the information collected and review the previous strategies and initiatives on sustainable use and production of energy in each city and other European initiatives.

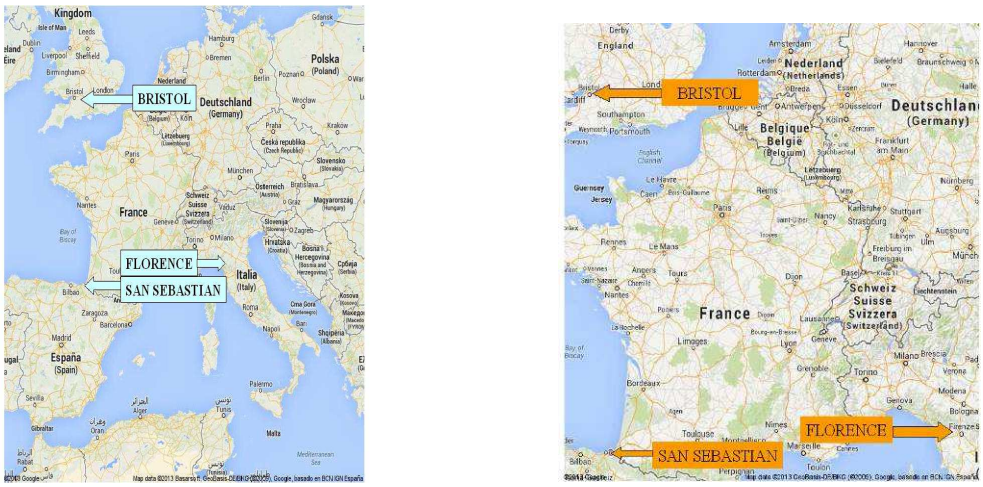
To reach the objectives we need to make a previous reflection on the actual scenario.

1.1.1 General context:

The cities partners of the project are City of San Sebastián, City of Bristol and City of Florence, 3 cities with similar characteristics, experience and policies in specific sustainable use and production of energy and very ambitious carbon and energy reduction targets, aligned with Europe's targets. In each city, initiatives to reduce energy inefficiency are already in place; however each of them has been aimed at a specific sector objective, while overlooking the impact that may be causing on other sectors. This is why all the stakeholders and city systems are considered so important when undertaking measures aimed at improving sustainability to make this an integral part of their urban planning in order to achieve best results in less time and with less cost.

For this reason, these cities have decided to join together to improve efficiency along all the key aspects of their energy value chain, by applying smart city concepts in an integrated manner while learning from each other's expertise and viewpoint in applying sustainable practices.

To get the proposed objectives STEEP project will create a process model based on systems thinking for district energy master planning, which will be applied to 3 city districts to better understand the systems impacting upon energy use and interventions which can be taken to meet the ambitious energy and carbon targets. These models will be enriched and validated through open innovation methodologies applied with the stakeholders. The learning obtained from the process model for district energy master planning, then, will be applied at the definition of specific action plan (time line, the costs and pay-back periods) at city level. With the knowledge gathered in this process, it will be developed a replicable open source methodology and Key Performance Indicators for developing and screening integrated Smart City Plans.



Location map

1.1.2 Specific context:

As it has been previously explained, each city has experience in specific actions related to sustainable use and production of energy (CIVITAS, Covenant of Mayors, CONCERTO, Green Digital Charter, etc.). Furthermore, each city has a specific economic, social and political situation that will result in different actions in a future integrated Smart City Plan. All these issues must be revised in the definition of an integrated sustainable plan in order to detect current problems, successful results, synergies, etc.

Additionally, because of the diversity of each city, each city manages the information, data and concepts to be used during the project in a different way. Consequently, to ensure coordinated work between the partners in the other work packages, it will be very important to harmonise concepts and knowledge between them.

Objectives: the main objective of Work package 1 is to define the fundamentals for facilitating the coordinated work between the partners in the following Work packages.

This main objective entails:

- Task 1.1 Exchange of best practices about previous experiences.

Next tasks:

- Description of characteristics and current status of each district, city.
- Set measurable targets and objectives, at the city and district level.
- Concepts and knowledge harmonisation.

To start with this, it's mandatory to begin with the current and past scenario and exchange this collected information between partners to share knowledge and increase knowledge about good initiatives that they could be implementing in other cities. It's also very useful to have knowledge of other European initiatives regarding this issue. That's task 1.1 purpose and the reason for this Deliverable.

2. DESCRIPTION OF RECEIVED INFORMATION

San Sebastián, acting as the leader of this task, asked the cities and participants to fill in a template with the previous and ongoing actions undertaken. These actions could be about ICT, mobility or energy efficiency. The template asked about objectives, stakeholders, achievements, goals indicators, conclusions etc. involved in the development of the action.

Each action has been submitted by the cities and participants, classified by field of action: ICT, energy efficiency and mobility. It has to be pointed out that even that all of them have a transversal impact on the three fields, they have been classified in the field where the energy reduction effect is stronger.

There are also some actions where it's quite difficult to determine which of the sectors is the most relevant. To fit these cases, a fourth field has been created in this document, called, Multiple-Sector.

Thus, the 1.1 task documents are listed this way:

- Energy efficiency
- Mobility
- ICT´s
- Multiple-Sectors

3. SUMMARY OF GOOD PRACTICES

According to the templates submitted by the cities and other participants of the project some relevant information has been gathered in order to have a better understanding of the different initiatives accomplished in the cities to reduce the CO2 emissions and energy demand.

The aim of this part of the document is to give an organized outlook of the gathered information.

3.1 Energy Efficiency

Many of the actions involving the energy efficiency of the cities are based on the improvement of the energy efficiency and renewable energy sources. These last ones are the most common among the cities. The actions taken in municipal buildings are mostly about changing their installations after auditing the buildings, thus, reducing their energy demand.

Among the partners of this project, Bristol and San Sebastián have actions involving the retrofit of the enclosure, based on the energy audit previously performed in the building, reducing the energy demand of the building by improving its outside insulation on private residential buildings with an improvement in the existing thermal enclosure. Each city plans the actions in a different way, but all of them have the same goal.

There are a number of actions to achieve this goal of reduction of energy demand, for instance, Bristol (including CSE) supports the energy related education of the citizens with specific programs for social groups that are at risk of exclusion and the elderly population. There's also a program to study the energy consumption in municipal buildings. Several workshops have been made with citizens and other people who have changed their home insulation or have installed some sort of renewable energy source, to promote exchange of experience among them.

Policy making is not easy, as there are different regulatory systems in these three countries. In some cases the local authorities can make policies to support energy efficiency, that's the case of Donostia-San Sebastián, who approved a local construction policy which involves installations and enclosure of the buildings.

In a more institutional field, the city of Bristol with the consultancy of CSE has evaluated the public subsidies in the UK for building retrofitting and energy efficiency purposes. Another project involves the installation in an industrial zone of the city of two, 6 megawatt wind turbines.

Another kind of actions are those related with renewable energy. These ones are repeated among the cities in some cases due to the support made by local policies and in another cases just because they have installed them. CSE presents a remarkable action on the support and testing of the projects involving the enclosure of buildings. It's also important to consider the relevance of the dissemination and awareness of the citizens to get involved in the reduction of the energy consumption. The adoption of a local policy like the local policy of San Sebastián is a good support for this.

There's also an outstanding and innovative action only in the city of Florence: The redensifying strategy of the city to avoid no urbanized new land occupation. The municipality of Florence allows increasing the building potential of the plots when grouped together. In this case, the retrofitting of buildings has to be done in terms of energy efficiency.

3.2 ICT

The use of the ICT's in cities is increasing by the new energy management options arising. These kinds of devices can measure and manage the input-outputs of energy in an autonomous way. The actions are taken in the fields of network analysis and the implementation of these devices on a smart grid.

The most relevant actions have been taken in Bristol, with an analysis of the effects produced on the customers. The aim is to know the way these technologies change the behaviour on the consumption of energy by the customers. The goal is to reduce the energy demand and quantify these reductions. In San Sebastián the access to this technology by the public has been improved by a local free WIFI network and the implementation of an optical fibre network.

This new network intends to be an operative platform for the internet and telecommunication companies. The aim is to increase the access of citizens to the ICT's.

The cable network is implemented when the council works on the renewal of the general city networks or the streets, which are in fact progressive and on going actions.

3.3 Mobility

Sustainable mobility actions are included in the three participant cities. All of them have a sustainable mobility plan, and support sustainable mobility transport systems (electric cars, bicycles, etc.)

Other popular actions are transformations of roadways to exclusive pedestrian zones. There are also actions concerning urban accessibility and adapted vehicles.

To avoid the traffic jams in Florence they have implemented a system called, "Traffic Supervisor". This system acts on the traffic lights in such a way that the timing of the lights is adapted in real time to the different scenarios, in order to reduce the traffic jams. The citizens can know in real time what's happenning in the city so that they can use alternative routes to those lines which are collapsed.

San Sebastián has been involved in several European projects, such as, Archimedes or Civitas.All these projects have intended to improve the general mobility with a number of different initiatives, electric car and bycicle rental or installing elevators on the streets to reach the upper zones of the city.

These actions where the citizens are suggested to change or have to change their customs or behaviour are very delicate. It's very much recommended the previous job on awareness and information. In all the cities concerned by this issue, important actions have been developed to face any arising problem.

3.4 Multiple Sectors

In this field we find the study to reduce the greenhouse gas emissions in Bristol by the use of renewable energies and energy consumption reduction. This action integrates transport, domestic waste management, fuel price reduction and general consumption reduction.

Public and private energy network combination is also mentioned to achieve a reduction up to a 40% of the greenhouse gases emissions. In San Sebastián, a similar action is proposed.

Bristol has a very innovative action not considered in the rest of the cities. The reduction of the energy bills is possible by bringing together several contracts in just one. The scale economy makes possible a cheaper energy cost.

4. Chart of Good Practices

ENERGY EFFICIENCY

Id.	PARTNER	INITIATIVE TITLE	DESCRIPTION / OBJECTIVES
EE – 1	SAN SEBASTIAN	Actuation in public buildings	Auditing, energy efficiency certification and register of public buildings.
EE – 2	SAN SEBASTIAN	Actions in residential buildings.	The main objective is to know the effects of different strategies on energy efficiency in buildings, related with the citizens of San Sebastián.
EE – 3	FSS (SS)	Renewable energy	Installation of Solar and Small Wind Power generators.
EE – 4	FSS (SS)	District Heating	District Heating in Txomin
EE – 5	FSS (SS)	Enertic Building	Cross-border development of the sector of renewable energies and energy efficiency
EE – 6	FSS (SS)	Best Energy	Built Environment Sustainability and Technology in Energy (BEST Energy)
EE – 7	TECNALIA (SS)	Pilot study	Energy and environmental refurbishment study of the district of Amara
EE – 8	BRISTOL	Renewable energy in Avonmouth	Bristol City Council is working on a project to install and manage 2 wind turbines with a combined capacity of 6 MW in Avonmouth.
EE – 9	BRISTOL	Energy study	Bristol Citywide Sustainable Energy Study
EE – 10	BRISTOL	Bristol Green doors	To promote the uptake of low carbon improvements in residential properties and thereby increase the energy efficiency of housing stock.
EE – 11	BRISTOL – CSE	Bristol Home Energy Upgrade	The aim was to test the underlying principles of the latest national government energy efficiency schemes, the Green Deal and Energy Company Obligation (ECO)

			by replicating the experience as closely as possible.
EE – 12	BRISTOL – CSE	Warming Bristol Communities	Helping disadvantaged members of Bristol's ethnic minority Community at risk of fuel debt
EE – 13	BRISTOL – CSE	Older People's Energy Network project (OPEN)	The project aims to improve the well-being of older people living in fuel-poverty in Bristol and the South West.
EE – 14	FLORENCE	ZERO VOLUME	The essential aim is to limit the use of land and the increase in the volume of construction in the municipal area.

MOBILITY

Id.	PARTNER	INITIATIVE TITLE	DESCRIPTION / OBJECTIVES
MOB – 1	FLORENCE	Traffic Supervisor	Supervisor of Traffic: the traffic supervisor is a system for control and centralized management of traffic and allows the identification of the state of current traffic on the network and the prediction of the future state in the short and long term.
MOB – 2	FLORENCE	Sustainable Mobility of citizens	The main lines of action consist on the one hand in pushing technological modernization of the vehicle fleet private assets and the other in the promotion of mobility pedestrian and public transport.
MOB – 3	SAN SEBASTIAN	Sustainable mobility	The general objective is to move towards a sustainable mobility in San Sebastián.

ICT

Id.	PARTNER	INITIATIVE TITLE	DESCRIPTION / OBJECTIVES
ICT – 1	SAN SEBASTIAN	ICT infrastructure Manager	A broadband deployment was a need for the city and its services at municipal level. But also to foster competitiveness with different cable operators to provide better services at more economic solutions for citizens and municipal personnel.
ICT – 2	BRISTOL	Green AddICT	The project has developed a methodology to calculate the carbon footprint of ICT within a local authority area, which was funded by the Carbon Trust.
ICT – 3	BRISTOL	3 HOUSES	The 3eHouses project aimed to support customers to reduce energy use in the home through increasing their understanding/ interaction with ICTs and smart metering systems.

MULTIPLE-SECTOR

Id.	PARTNER	INITIATIVE TITLE	DESCRIPTION / OBJECTIVES
MS – 1	BRISTOL	ELENA	Programme to develop investment programmes in energy efficiency and renewable energy projects in Bristol and the wider sub-region – with an estimated potential investment of up to £140 million.
MS – 2	BRISTOL	Climate Change &	The Bristol Climate Change and Energy Framework 2012-15 was adopted in

		Energy Security Framework 2012-15	March 2012 sets out how the City Council will work with partners to reduce the city's CO2 emissions by 40% by 2020 from a 2005 baseline, and how the city will adapt to climate change.
MS - 3	BRISTOL	Smart City Bristol Programme	The aim is to use smart technologies to meet our ambitious target to reduce CO2 emissions by 40% by 2020 from a 2005 baseline, and our wider social and economic objectives.
MS - 4	BRISTOL	Bristol Citywide Sustainable Energy Study	The aim of this study was to assist Bristol City Council in developing Local Development Framework (LDF)* policies which positively encourage reduced energy consumption and carbon emissions from buildings and greater sustainable energy generation.
MS - 5	FSS (SS)	I-SARE	The goal of the project is to create an intelligent micro-grid efficient, sustainable and safe that will serve as laboratory for development and experimentation of different new technologies in power generation and storage.

5. TEMPLATES

5.1 Energy Efficiency

➢EE 1 -Auditing, energy efficiency certification and register of public buildings.

Initial Date	20/10/2013	**End of submission date**	25/10/2013

Participant name	Ayuntamiento de San Sebastián
E-mail	jon_gastanares@donostia.org,
Field	Energy efficiency

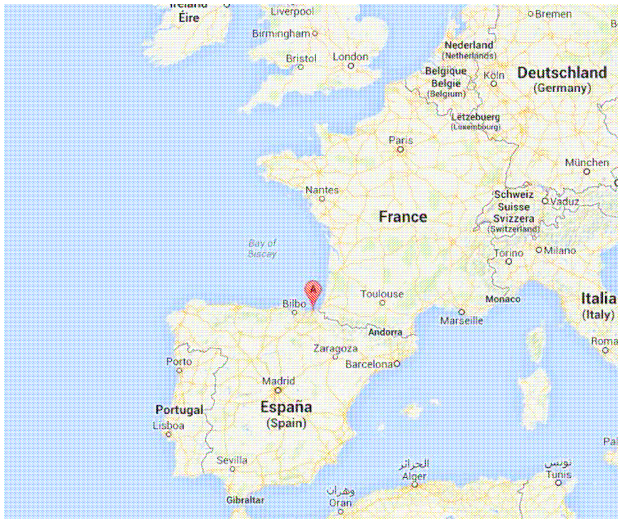
☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	1

Initiative Title (Only public or public-private initiatives)

Auditing, energy efficiency certification and register of public buildings.

Location Map



Initiative objectives

The main objective is to know which is the energy efficiency behaviour of the municipal buildings.

Depending on the results, different actions are proposed for every single building in order to achieve a better energy efficiency.

Initiative description: target areas, technologies

The first step was to know the energy efficiency of our buildings. The target areas were mainly lighting, heat and power installations. and thermal insulation.
The fact is that thermal insulation is not being retrofitted, only installations.
We use Automation, efficient lighting and energy performance boilers.
Sensorisation, and monitoring systems.
The registration is something to be done for the >250m2 public buildings.

Starting year-Duration

2010 until now

Three years duration

Current situation

5 Buildings have been certified. Registering system will be available soon.

43 Buildings audited.

255 energy contracts analysed. 177 of them modified.

Three buildings audited by EKOSCAN environmental management system.

Key Performance Indicators
The main indicator is the energy consumption reduction in kWH.

Key stakeholders
The only one is the SS municipality and its personnel.

Lessons learnt
- There is a big potential of savings by the retrofitting of installations, the return of the costs is 4 to 6 years - Insulation renewal takes a great amount of time to recover the costs. - There are many actions of nearly zero costs. - The personnel's attitude is crucial in this context.

Cost of the project
During this three years, the cost has been of roughly 235.000 €

Energy savings & other sustainable achievements
The energy savings are more than a 25% In some cases the savings are more than 40% (boiler changes e.g.)

➢EE 2 – Actions in residential buildings

Initial Date	20/10/2013	**End of submission date**	25/10/2013

Participant name	Ayuntamiento de San Sebastián
E-mail	jon_gastanares@donostia.org,
Field	Energy efficiency

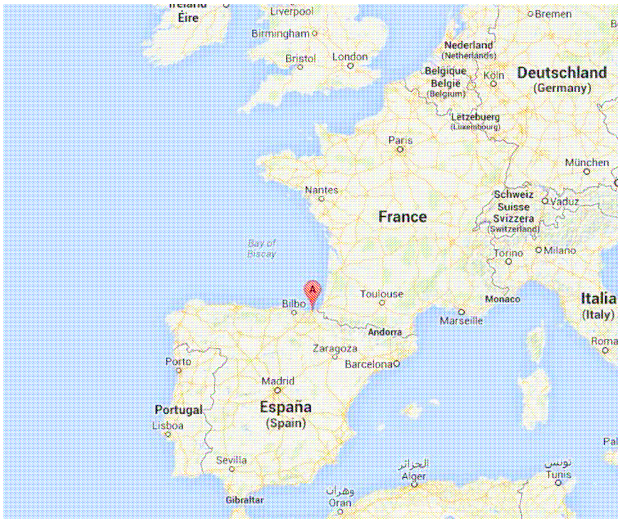
☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	2

Initiative Title (Only public or public-private initiatives)

Actions in residential buildings.

Location Map



Initiative objectives
The main objective is to know the effects of different strategies on energy efficiency in buildings, related with the citizens of San Sebastián.

Initiative description: target areas, technologies
1.- Building Retrofitting: Reduction of energy demand by passive and active strategies. 170 new retrofitting actions have been submitted to construction license under new local policies on energy efficiency in buildings. 3.- Monitorisation of old heat installation by heat splitters. 4.- Energy study of a retrofitted building. The energy consumption and comfort levels of an inhabited building in Donostia has been studied for three years. We have used temperature end moisture dataloggers for this. 5,- Homes Donostia CO2. Families are provided with a smart energy counter and good practices are tested in order to achieve a better energy consumption at home.

Starting year-Duration
2010 until now Three years duration

Current situation
180 families have joined the Homes Donostia Project. The local policies on building retrofitting have changed in order to achieve better energy savings. Both projects, Heat splitters and comfort on a retrofitted building will be finished by april 2014.

Key Performance Indicators
The main indicator is the energy consumption reduction in kWH.

Key stakeholders

- SS municipality and its personnel.
- Householders
- House administrators
- Energy efficiency related enterprises.

Lessons learnt

- There is a big potential of savings by the retrofitting of buildings and installations, the return of the costs is 4 to 6 years for systems and 25 years for the insulation renewal.
- Insulation renewal takes a great amount of time to recover the costs.
- There are some actions of nearly zero or zero costs.
- The householder's attitude is crucial in this context.

Cost of the project

During this three years, the cost has been of roughly 200.000 €

Energy savings & other sustainable achievements

The energy savings are more than a 25% with retrofitting of the closure insulation

In some cases the savings are more than 40% (boiler changes e.g.)

Changes on heat counter individualisation give up to 30% energy savings.

With the home monitorisation we get 7% savings by changing inhabitants behaviour.

➢EE 3 – Installation of Solar and Small Wind Power generators.

Initial Date	01/06/2008	**End of submission date**	On going

Participant name	Fomento San Sebastián
E-mail	Ana_Aizpuru@donostia.org
Field	Renewable Energies

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	3

Initiative Title (Only public or public-private initiatives)

Installation of Solar and Small Wind Power generators.

Location Map

Located throughout the city. This initiative has been extended in the whole city

Initiative objectives

Among the initiatives foreseen in the Local Agenda 21in Donostia-San Sebastián it was considered

investments for the installation of renewable energies in public buildings. The aim was to take advantage of the buildings' roof as based for the installation of photovoltaic, mainly, and solar panels. Thus, electricity generation through the photovoltaic panels could be exploited and in the case of solar panels heat for the heating system of the buildings. Since 2000 the Council started to install at small scale (below 5 kWp) some panels.

However, it is in 2008 that Fomento San Sebastián takes the lead on behalf of the Council in the installation of photovoltaic panels in public buildings as long as it is feasible. With the approval of the Local Law for Energy Efficiency and Environmental Quality of buildings the Council provides the legal framework for the implementation of a number of initiatives in this field including the installation of renewable energies.

First, with the installation of photovoltaic panels and later also with the installation of small wind power generators, at present the Council has an installed power output of over 1 MW.

Initiative description: target areas, technologies

The photovoltaic installation in the Belartza centre in 2006 showed that these installations were feasible not only environmentally but also economically. As a consequence, and taking into account the legal framework provided by the Council, Fomento San Sebastián adopted the mandate to develop the whole municipal network as a single project. It was developed a Covenant based on the right to use the public domain to install solar panels in all feasible buildings with the criteria of maximum surface optimization.

This has been a pioneer initiative in the urban sphere to install renewable energies, cut the A/C and electricity bills, reduce CO2 emissions and valorise public domain in power generation. Local companies from the energy sector were awarded so that the local sector also took advantage of the initiative and citizens were made part through advertising campaigns and open monitoring of the new facilities. Being an example of the use and installation of renewable energies also has a showcase effect multiplying the impact both fostering the economy of the sector and reducing the emissions.

Focus was on sport centres, cultural facilities, iconic buildings, enterprise centres, etc. It was foreseen compatibility with solar thermic facilities to be used for heating. Around 100 public buildings were analysed. Almost half did not meet minimum requirements because their poor orientation, shadows, irregular roofs, lack of space or historic value. Finally 37 buildings were selected and the investments made in several phases:

- Phase 0 (2006): 3 existing installations, 101 kWp
- Phase 1 (2008): 10 new installations, 515 kWp
- Phase 2 (2009-2010): 8 new installations, 202 kWp
- Phase 3: 19 (6 new installed and 13 in feasibility study), expected 426 kWp

There are also two small Wind Power generators installed in Pi@ Centre and in Enertic. The total output of these installations is about 1,75kWh in Pi@ (with a Donqui generator) and 2,4kWh in

Enertic building (with a Skystream generator).

Starting year-Duration
This is an on-going project started in 2008 and with some new installations foreseen in next years. However changes in National Legal Framework related to renewable energies has signified an important change in the direction of policies related to the installation of new facilities leaving the project in standby.

Current situation
The calendar for the new installations will depend on budget restrictions and the development of the feasibility studies. The bet is clear but recent changes in National Law about renewable energies have changed significantly the framework for the installation of renewable energies in Spain. As long as there are not new changes on it, it will be difficult to continue with the process. Specially in the case of photovoltaic panels which electricity was bought by the system till the change in the Law instead of being only for own consumption as it is now. The economic feasibility of the installations has drastically change by not being able to sell any more the whole production to the grid.

Key Performance Indicators
There are different key performance indicators to be considered by comparing the use of renewable sources against market prices and possibilities in: - Cost of kW for heating - Cost of kW for electricity - CO_2 emissions - Generated Power in kWh - Exploitation of generated power (monthly basis): Generated Power/Used Power

Key stakeholders
Main stakeholders for the implementation of the project have been the Council and Fomento San Sebastián as developer of the strategy. It has been important as well the participation of the maintenance managers in each building, and the companies and installers of the different

facilities.

Lessons learnt

The changes in the National Law have changed completely the framework in which the project was being developed. In this sense sustainability of projects based on public support may change and leave at risk the whole planning. It is important the alignment of public policies from municipal or local level to regional, national and even European level, but when these alignments are in place they should not be changed.

At local level the project was important for local companies. The Council itself was used as a main reference for the installation of renewable energies in private houses, companies, etc. Therefore it was having a multiplying effect in the cut of CO_2 but also in the generation of business at local level.

Cost of the project

The cost of the project is estimated at 3,5 million for achieving around 1 MWp from 27 new installations. Some new installations are being studied so that new buildings will be incorporated to the total cost and output.

Energy savings & other sustainable achivements

Generated power through renewable energies will mean savings of over 800 tons/year emissions of CO_2 to the atmosphere. In terms of savings in the electricity bills, we can say that 1MWp represents the consumption of over 2.200 families per year.

➢EE 4 – District Heating in Txomin

Initial Date	01/06/2011	**End of submission date**	On going

Participant name	Fomento San Sebastián
E-mail	Ana_Aizpuru@donostia.org
Field	Energy – District Heating

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	4

Initiative Title (Only public or public-private initiatives)

District Heating in Txomin

Location Map

The project is located in the district of Txomin, between the districts of Loiola and Martutene.

Initiative objectives

In the area of Txomin, by the Urumea Riverside, a whole new district of 140.000m² will be built including 1.482 houses in more than 65 new buildings, around 10.000m² for tertiary use and 9.120m² for community facilities. About 600 houses will be social houses.

The project foresees a sustainable generation and distribution of energy for the district heating. There is a wastewater treatment plant nearby from which heat utilization will be implemented. This will be complemented by a cogeneration plant and a biomass boiler to supply heat to the entire district. According to the feasibility study over 95% of the new houses will be connected to it.

The financial scheme of the project is a Public Private Partnership in which the Council may take part in the business operation through shares in the new company.

Initiative description: target areas, technologies

The housing project has two phases and three stages in the first phase:
Phase 1A: 527 New houses, 44.200m² for residential use and 1.832m² for tertiary use.
Phase 1B: 395 houses, 36.996m² for residential use and 994m² for tertiary use.
Phase 1C: 201 houses, 18.160m² for residential use, 1.162m² for tertiary use and 1.500m² for community facilities.
Phase 2: 359 houses, 31.129m² for residential use and 3.214m² for tertiary use.
The urbanization and construction of Phases 1A and 1B will be close in time (between 2015-2016), phase 1C in 2017-2018. Later, and with the development of Antzita District there may be another 200 houses that will be part of the District Heating.

The power generation for the district heating will be based in the heat recovery from the wastewater treatment plant although yet pending definition of feasibility study to determine the thermal power that will be recovered. Rest of technologies implemented will be:

- 1 biomass boiler with a thermal power of 1 MW.
- 3 natural gas boilers with 3.200 kW of thermal power each.

It was foreseen the installation of a cogeneration plant that would allow to sell electricity to the electricity grid. However with the change of Spanish law for renewable energies it must be analysed again whether it would be interesting to maintain it in the project for self-used in the district. When the project was prepared the national grid was obliged to buy all power exceeds from renewable sources. This has just been changed so there is not obligation anymore. Therefore it must be studied again whether keep it in the project or take it away.

The project will also reduce the energy cost of the heat for residents. These savings will be substantial from the first day of operation. It is expected to be over 11%.

Starting year-Duration

The urbanization and construction will begin in 2014, although first houses will not be available till 2017-2018. The whole project will take around 6 years. It is expected to be finished by 2020.

Current situation

The project will have the same calendar as the urbanization of the area. Demolitions have begun and before contracting it will be possible to start with the urbanization. It is expected to have it contracted in the first trimester of 2014. At present the new feasibility study is in progress to include the heat recovery from the wastewater treatment plant and the inclusion or not of the cogeneration plant.
Some possible private partners have been sounded as well. The operation is feasible and profitable so the implication of the private sector is assured.

Key Performance Indicators

There are different key performance indicators to be considered by comparing the use of renewable sources against market prices and possibilities in:

- Cost of kW for heating
- CO2 emissions

And of course the income that will generate at municipal level and its profitability.

Key stakeholders

The main stakeholder is the Council that will provide the distribution network and the soil for the plant. But also the willingness to do it and consider it in the planning of the area. At the same time it will also play an important role the wastewater treatment plant that belongs to Aguas del Añarbe a public company in which the Council of San Sebastián also is represented. And finally the private company that will act as operator of the system and will make the investment in equipments.

Lessons learnt

The project is on-going so there are not many learnt lessons about it. It is expected to be successful taking into account that the project will have a payback period of time of 6 to 11 years generating savings in emissions of over 85%.

Cost of the project

The cost of the project is estimated at 3 million although if finally the cogeneration plant is taken away from the project there will be a reduction of about half million.
The business model will be directly related to the investment that must assume the company that will manage the operation and the public investment that they will have to pay-back through different ways (shares in the capital, rentals, etc.). The operator must build the facility, the generation elements (boilers) and the management and control components. The distribution network is foreseen in the urbanization project; hence, it can be done by the Council itself. In addition to that, the Council will contribute with the plot for the construction of the plant and the right to the use of public domain.
The expected ROI for the project ranges from 12% and a payback of almost 12 years (worst scenario) to 26% and a payback of 6 years (the most optimistic one). In these two cases the expected NPV goes from 1 million to more than 4,5 million (in twelve years' time).

Energy savings & other sustainable achivements

All feasibility studies and the different scenarios show that there is an important reduction on the CO_2 emissions. For occupancy rate of 95% in the most optimistic scenario the conventional system would liberate 41.083 Tons per year of CO_2. The proposed district heating scheme would reduce these emissions to 6.519 Tons per year.

This is a reduction of over 84% of the emissions.

In the case of a more pessimistic scenario the numbers for the conventional system are 20.943 Tons per year while in this solution are 1.677 Tons per year. The reduction in percentage is of

almost 92% of the emissions.

Reduction in demand gives more weight to the biomass in the energy mix.

This solution with a centralized heat system reduces the area that is needed in each building/house for heating purposes. Furthermore the presence of smokestacks is also reduced and the system is safer. The centralization of the natural gas and a gas detection system avoids the presence of gas in each building.

➢EE 5- Enertic – Building

Initial Date	30/06/2009	**End of submission date**	Ongoing

Participant name	Fomento San Sebastián – Council of San Sebastián
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Field	Renewable Energy, Bioclimatism and energy efficiency

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	5

Initiative Title (Only public or public-private initiatives)

Enertic – Building

Location Map

The building is located in Poligono 27 near the districts of Txomin, Martutene and Loiola in Donostia-San Sebastián.

Initiative objectives
The overall goal of the project is to contribute to the cross-border development of the sector of renewable energies and energy efficiency. It is aimed to provide companies with the possibility of concentrating in the same space (building) to favour collaborations and development of projects. The project proposes a sustainable physical space (a bioclimatic building according to standards of maximum energy efficiency, incorporating renewable energy sources also), that will allow hosting different stakeholders from the sector (companies, research centers, training organizations, consulting companies, etc.). The Center will become in a space for consolidation, growth and appearances of collaboration possibilities that will strengthen employment generation of the cross border fabric. It will also provide the city of San Sebastián and the Basque Country with an infrastructure in this sector facilitating new projects and adding value to the territory. The specific goals are: - Place in the new center the cross-border regional Cluster of renewable energy and energy efficiency. - Strengthen the Research & Development capabilities of the sector. - Improve the competitiveness of regional cross-border sector. - Consolidate an observatory for the diagnosis and monitoring of the sector. - Promote and encourage cooperation and internationalization - Promoting the sector through different dissemination activities.

Initiative description: target areas, technologies
This project, coordinated by Fomento San Sebastián, is designed to encourage the development of renewable energy and energy efficiency in the crossborder region, supporting and catalysing cross-border dynamics of cooperation in this field. Companies from the sector will be able to compete only by providing services of high value added and being able to innovate continuously. However, most of them are SMEs with less than 20 employees and with a limited innovation capacity in terms of resources that can be directly address to this purpose. The project intends to offer them the possibility of getting support and assessment including R&D services, training and a physical space in which locate themselves at affordable rates. The main action of the project is related to the construction of a new building close to "zero emissions" that will be home to the cluster and companies from the sector. The new facility will be constructed with a bioclimatic architectural design including photovoltaic panels, one small wind turbine and geothermal generator to provide the building with electricity and heat. The total area of the building divided in 6 floors will be of 13.526 m^2.

Apart from giving the possibility to rent space and share some infrastructures, the building will offer services and tools for collaborative work in respond to the needs of companies, research centers, engineering services, etc. For instance common spaces for exchanging ideas and take advantage of dissemination activities. The project was partially funded by the European Territorial Cooperation Programme Spain-France-Andorra (POCTEFA) 2007-2013.
The high efficient space may locate around 55 companies (depend on the space requirements of guests). The total surface for renting will be of over 5.400 m^2 including the following services:

- Natural lighting and ventilation
- Raised floor and false ceiling quality
- Cold and heat generated from geothermal energy
- Complete installation of electricity, voice and data. Including fiber.

The technological equipment and common spaces are:
- Ground floor with a research & development unit
- Wi-Fi common area
- Meeting rooms
- Lectures with projection at the Auditorio
- Concierge services
- Zone of experimentation (plot to locate renewable energy experimentation projects).

Among the services offered by the center there will be assessment to entrepreneurs and companies, R+D+I services, training, networking with other companies, dissemination activities and the possibility of collaborate with companies from the French border to internationalize the local project and open new commercial possibilities.

The building itself will act as showcase to attract interest from other clusters and companies worldwide to help the internationalization processes of the guest companies.

Starting year-Duration

The project started in 2009 and the building was constructed by summer of 2013. In September 2013 the second phase related to fitting-out the inner spaces started and it is expected that the first companies will be able to establish in the building by May 2014.

Current situation

The second phase is on its ways with the refurbishment of A/C conditioning, electricity, fire conditioning, ICT, etc. Before summer 2014 guest companies will be able to transfer to the

building.

In the meantime a number of activities and services are being provided to the sector through the renewable energy and energy efficiency cluster led by Fomento San Sebastián. Among other services, training, assessment and internationalization accompaniment are provided.

Key Performance Indicators

Key performance indicators are:

- Number of people involved in services/actions provided by the center
- Number of companies establish in the center
- Number of collaboration projects generated in the center
- Number of visits received by other companies/clusters in the energy sector
- CO_2 emissions in the building
- Number of services provided and acceptance level by the sector
- Payback period according to occupancy rate

Key stakeholders

Main stakeholders in the project are the Council and Fomento San Sebastián as developers of the project. In the case of Fomento San Sebastián will also operate the building and services related. Eskal, French cluster for energy effiency, also acted as partner in the project providing their knowledge in the definition of services and bringing French companies to the project.

In any case the most important stakeholders will be the companies that will locate in the center in few months. The type of companies and their openness to information exchange will be crucial for the development of new ideas and projects. They will be a fundamental part of the success of the project.

Lessons learnt

The crisis situation all over Europe and specially in Spain, somehow has originated an slowdown in the commercialization process of the available space. Changes in the regulatory framework of the renewable energy sector have also been something to take into account. The affection can hardly be accounted in numbers but for sure it has been an important obstacle.

In any case we will have to wait till inner spaces in the building are ready to see the response grade of companies and sector.

Cost of the project

The total cost of the project is 7.532.640€ that corresponds to the construction of the building. In a second phase all rooms and installations are being adequated for guest companies or organizations. This phase has not concluded yet but the budget is of 1.674.984€.
The project was partially funded under the Avanza Plan (program of the Spanish Ministry of Industry, Energy and Tourism) and the the European Territorial Cooperation Programme Spain-France-Andorra (POCTEFA) 2007-2013.

Energy savings & other sustainable achievements

The project is ongoing with the preparation of the different spaces, rooms and services that will be offered to companies. Nevertheless the following achievements are foreseen:

- Strengthening of the competitiveness of SMEs in the renewable energy and energy efficiency sector in the influenced area of the project through more collaboration among companies ane higher level of innovation in products, services and projects.
- Development of a cross-border sector that will be more visible to national and European clusters and possible partners.
- Concentration of companies in a single hub to promote the exchange of information and the development of informal collective intelligence on the sector. Informal relations and networks are a main engine for the development of new projects and ideas.
- The project will help to create a brand image of the city of San Sebastián in the field of renewable energies and energy efficiency.

Based on this project already over 1000 people have been engaged in different events, seminars, training sessions, commercial missions, etc. When the building is ready we will be able to evaluate the impact in terms of number of companies that decide to base themselves in this new center.

➢EE 6- Built Environment Sustainability and Technology in Energy (BEST Energy)

Initial Date	30/02/2009	**End of submission date**	30/04/2012

Participant name	Fomento de San Sebastián
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Field	Energy Efficiency

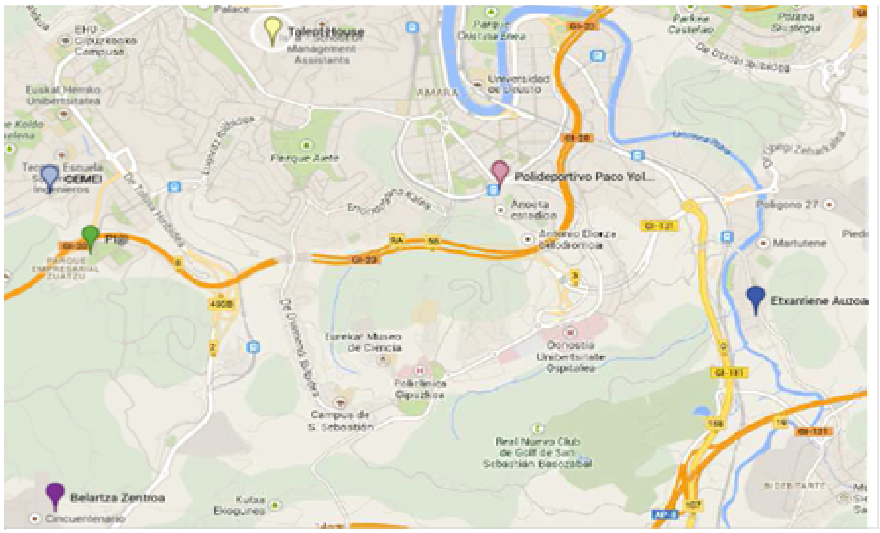
☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	6

Initiative Title (Only public or public-private initiatives)

Built Environment Sustainability and Technology in Energy (BEST Energy)

Location Map



http://www.bestenergyproject.eu

Initiative objectives

The main objective of this project is to improve the energy efficiency in public buildings and street public lighting, by the ICT-based centralized monitoring and management of the energy consumption and production, and to provide decision makers with the necessary tools to be able to plan energy saving measures. The specific goals are:

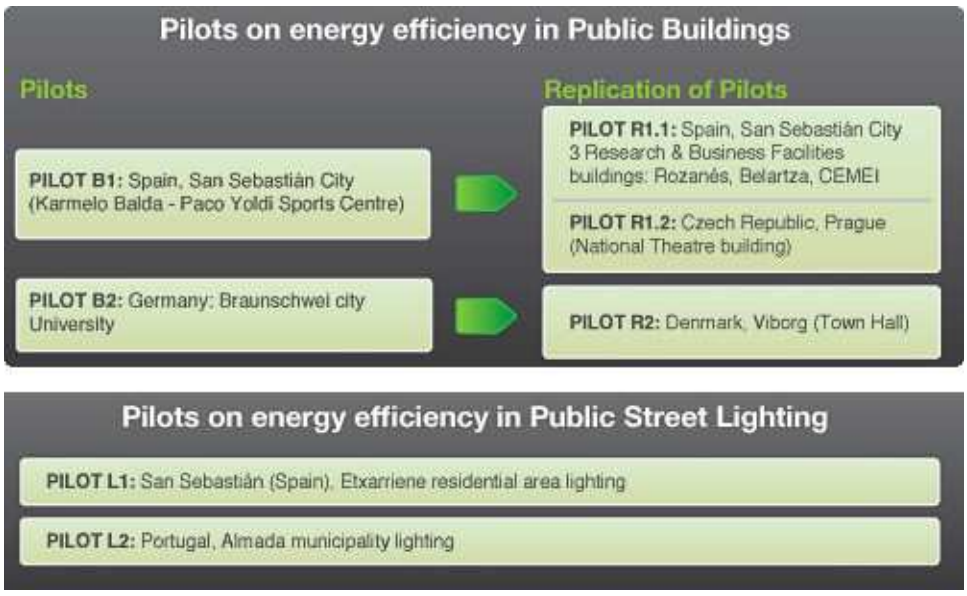
- The continuous (real time) monitoring of the energy consumption and generation as a way to allow centralized control systems to optimise energy performance.
- And at the same time, heightened energy consumption awareness that is expected to stimulate behavioural changes on the users of the energy.

The initially quantified objective is to achieve an energy consumption reduction of 12% in buildings and 30% in public lighting systems.

Initiative description: target areas, technologies

BEST Energy project belongs to the ICT Policy Support Programme (ICT PSP) under the Competitiveness and Innovation Programme (CIP) that aims at stimulating innovation and competitiveness through the wider uptake and best use of ICT by citizens, governments and businesses, particularly SMEs.

In the case of San Sebastián the pilots involved were:



In the Paco Yoldi Sports Centre, building management devices connected to an OPC server that offers their data to a third party software (read only) were installed. This is an OPC Client/Server based communication tool with a web-based interface.

In the case of the Street Lighting pilot in Etxarriene (about 16.000m²) the installation of electronic ballasts and controllers for each luminaire (79 lamps), the segment controller and OPC Server software reading the data from the ballasts and serving it to a third party software.

An then replications in Belartza (Net Floor Area 4.910m2), CEMEI (Net Floor Area 17.541m2) and Rozanes (Net Floor Area 6.888m2). A forth building was added, PI@ building in Zuatzu Technology park.

In order to get the objective the following phases will be follow in the pilots:
Phase 1: Collaboration of the public entities in charge of the buildings, together with technological companies expert in ICT and Energy fields, for the design and implementation of specific ICT systems allowing the real time monitoring and control of the energy consumption and production in the building, with real time communication and web management features. The systems are integrated with the existing installations which allow controlling several installations in each of the buildings (heating, air conditioning, lighting, ventilation … etc.).
Phase 2: Assessment of the continuously collected data (and indicators defined previously), and design of the concrete measures to be introduced in order to optimize the energy efficiency of the buildings: after the implementation of the hardware and software elements of the systems, the energy measures provided by the systems will be analysed and assessed in order to design specific energy saving measures which will allow the buildings to be more energetically efficient.
Phase 3: Implementation of the designed energy saving measures (including one year validation). Once the specific energy saving measures have been designed, these are implemented through their programming in the energy management systems. The measures will deal with aspects such as:

- The coordination of the several systems operation from the point of view of the energy efficiency, taking into account also the energy production in the building (photovoltaic energy and cogeneration).
- Messages to users of the buildings for user awareness raising.
- Messages to users of the buildings to ask for some kind of actions (eg: to close the windows).

Phase 4: Assessment of the results of the pilots. For the energy efficiency assessment, standard calculation methods of the energy ratios obtained are used and applied to the specific building features.
Phase 5: Dissemination of the results and experiencies.

Starting year-Duration

The project began on February 2009 and was completed on April 2012. However, designed measures, both technical and non-technical, will continue to be implemented.

Current situation

The project is over although the monitoring of the buildings remains as a management tool for improving energy consumptions. There is also an internet website in which any citizen can see the real consumption of these buildings and the performance of the difference measures that are being taken to reduce it. The website is:
http://efomenta.fomentosansebastian.org

Key Performance Indicators

Among others, main performance indicators are:

- Annual primary energy consumption (kWh_p/a)
- Annual delivered electrical energy (kWh_f/a)
- Annual delivered heating energy (kWh_f/a)
- Annual delivered cooling energy (kWh_f/a)
- Annual CO_2 emissions (ton CO_2/a)
- Relative reduction of CO_2 emissions (%)
- Relative energy savings in primary energy (%)
- Energy cost savings using actual local energy prices (€/a)

There are other secondary indicators that will be used to analyse much more in detail the success of the implemented measures.

Key stakeholders

The coordinator of the project was Fomento San Sebastián who worked closely with the Council of San Sebastián for the selection of involved Public Buildings and Street Lighting area monitored in the city of San Sebastián.

The consortium included another twelve partners from Spain, Germany, Denmark, Portugal and Czech Republic. Four of the partners are Public/Municipalities, three are ICT expert companies and five are Energy Expert Consulting companies.

Lessons learnt

Main lessons are:

- It is highly recommended to involve building management from the early stages so that better insight in the building operation can be obtained, and weak points of the system can be defined and corrective actions taken.
- Users should be involved into this whole cycle of the project implementation
- Technical audit and site inspections must be done at the beginning of the project.
- Design of optimization plan and users' involvement strategy should be preceded by an analysis of users' needs for example towards indoor climate. It is important to assure users' acceptance and involvement.
- Keep a monitoring routine in order to detect errors or possible improvements.
- The monitorization plan should be dynamic and adaptable to changes.
- First actions that have to be studied are those based in zero cost actions.

Cost of the project

The cost of the project depends on the building and if the building has already a Building Management System. In the case of Paco Yoldi Sports Centre the cost has been of 135.095,28€ plus the Human Resources cost from Fomento San Sebastián and City Council.

Energy savings & other sustainable achivements

All the pilots have approached the absolute target of reducing the power consumption, 12% in buildings and 30% in street lighting. The following percentages show the savings achieved until December 2011 for each pilot:

- Pilot B1 Paco Yoldi Sports Centre: 9% energy saving.
- Pilot L1 Street Lighting in Etxarriene: 24% energy saving.

Even though the project ended in April 2012 the designed measures continue and the following impacts are expected:

- Pilot B1 Paco Yoldi Sports Centre: 16% energy saving
- Pilot L1 Street Lighting in Etxarriene: 33% energy saving.

Regarding the replications in the other three public buildings in the city, the following percentages show the savings achieved during the period of collecting the data:

- Pilot R1 – 1 Belartza: -7, 81%

- Pilot R1 – 1 CEMEI: 58,87%

In these cases, the monitored consumption varies from the estimated theoretical baseline. The use of ratios for the calculation of the baseline may cause calculation errors. In any case the consumption of the entire building are now being monitored giving precise information.

- Pilot R1 – 1 Rozanés: 43,10%

This building was inaugurated in January 2011, and opened to public in April 2011, which means that some more time will be needed for reliable monitoring (apartments occupancy is being gradual yet).

➢EE 7- Energy and environmental refurbishment study of the district of Amara

Initial Date		**End of submission date**	25/10/2013

Participant name	Xabat Oregi, Patxi Hernandez
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Field	Energy Efficiency

☐ ICT´s ☐ Mobility ■ Energy efficiency

Initiative number	7

Initiative Title (Only public or public-private initiatives)

Energy and environmental refurbishment study of the district of Amara

Location Map

City of Donostia. District of Amara

Initiative objectives

San Sebastián City Council launched in early 2010 this pilot study to improve existing high density

residential buildings energy . One of the studies was conducted in the district of Amara, focusing on buildings built between 1960 and 1980, which housed various types representing the city building stock.

The initiative, designed by the Municipal Environment area has been funded by the Housing Department of the Basque Government. It is part of the Local Action Plan against climate change and the commitment by the city within the "Covenant of Mayors" to reduce its CO2 emissions by 20% by 2020.

The objective is to extrapolate the findings of first actions in Amara district to other buildings and other areas of the city, disseminate the multiple benefits of energy rehabilitation, and motivate neighboring communities in the knowledge of the advantages of this type of rehabilitation.

Initiative description: target areas, technologies

The energy rehabilitation aims to reduce energy demand by improving their envelope (insulating walls and roofs) and installations (facilities more efficient), achieving comfortable conditions for residents and environmental improvements for citizenship in general.
The methodology reported for this study is based on analyzing a representative building that can be extrapolated its results and criteria for the neighborhood, where its purpose will focus on four aspects

1. Determine the most appropriate action in rehabilitation with energy criteria.

2. Estimating the environmental impact of the refurbishment strategy

3. Assess the possibility of intervention in the heating and lighting system of buildings.

4. Linking energy aspects with economic and regulatory parameters

To do this, the technology used is only focused on the "energy conservation" strategies: refurbishment of the facade, roof and Windows.

Starting year-Duration

Starting year: 2009.

Duration: 18 month

Current situation

The heating demand of buildings between 60s and 80s in Amara district is really large for a

maritime climate such it is in San Sebastián, and can be reduced by insulating the envelope, before thinking on on-site or off-site renewable energy.

Within this project, various studies were carried out studying building refurbishment options and the results are published on the website of the City of Donostia:

http://www.donostia.org/info/ciudadano/ma_quienes.nsf/vowebContenidosId/NT00000A9E?OpenDocument&idioma=cas&id=A501610420151&cat=En%20tu%20comunidad%20de%20vecinos&subcat=En%20la%20rehabilitaci%C3%B3n%20de%20los%20edificios&doc=D

The case study building in the neighborhood of Amara was rehabilitated following the guidelines of the work in this project.

It was recommended to upgrade insulation levels, and therefore and integral renovation of the façade was carried.

Refurbished building – Isabel II street

Key Performance Indicators

The main indicator for this project was the heating energy demand. The project focused on improving the thermal performance of the envelope.

Actual heating use after the refurbishment is being monitored.

Key stakeholders

The involvement of the municipality has been constant and its concern about the high energy consumption of existing buildings did make this work. The council has made efforts to disseminate and report the energy, economic and environmental benefits of the rehabilitation.

A website to connect building refurbishment professionals with property owners and to perform a preliminary energy and economic assessment of a refurbishment project was set up by San Sebastián city council.

http://www.donostia.org/medioambiente/vivienda/index_c.html

Lessons learnt

The energy refurbishment improved the quality of housing, both reducing energy use and improving indoor quality. For apartment owners, there is also an improved energy rating in case of rent or sell. These reasons lead directly to a revaluation of housing, in many cases with a direct recovery of the investment.

Cost of the project

Estimated cost of 250 € per square meter of building envelope.

Energy savings & other sustainable achivements

Relevant conclusions regarding with this project:

- Measures to insulate the exterior walls and decks are the most effective in apartment buildings from 60s to 80s, achieving savings between 15% and 40% depending on the type of building and construction solution employed. The external insulation is the most recommended, because it prevents and eliminates thermal bridging possible condensation.
- Replacement windows with high insulation quality glass is another of the key measures in rehabilitation, producing savings of between 10% and 30%, further improving the living comfort by controlling the levels of air infiltration and radiant temperature of the windows.

- Regarding the heating and hot water, it is recommended to replace the pre-1998 equipment, using condensing gas boilers and control systems that optimize their operation and reduce fossil fuel consumption.

➢EE 8- Avonmouth Wind Turbine project

Initial Date		**End of submission date**	25/10/2013

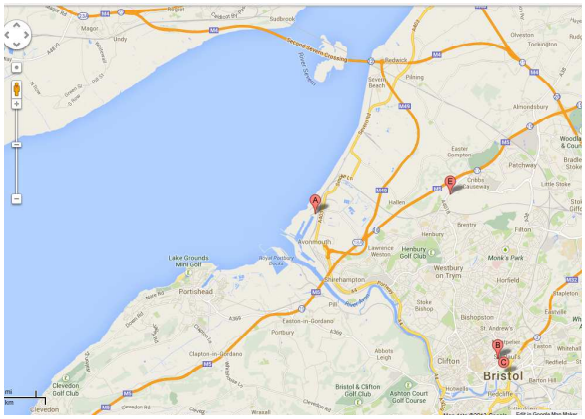
Participant name	Bristol City Council
E-mail	indira.norton@bristol.gov.uk
Field	Renewable energy

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	8

Initiative Title (Only public or public-private initiatives)
Avonmouth Wind Turbine project

Location Map



Avonmouth – Bristol:

Initiative objectives

Bristol City Council is working on a project to install and manage 2 wind turbines with a combined capacity of 6 MW in Avonmouth, an industrial area in the City of Bristol. This project is about producing green electricity and reducing the city's carbon footprint.

The wind turbine development will demonstrate:

- good use of council owned land;
- a flagship development by the council, setting a good example;
- a meaningful contribution to the city council's targets for installed capacity;
- active promotion of a sustainable energy future for Bristol and its communities;
- a good project for Avonmouth generating green energy in an industrialised setting.

Initiative description: target areas, technologies

Bristol City Council applied and was granted planning permission in 2009 to build the two wind turbines on a former Shell Tank site in Avonmouth. When councils apply to their own planning committee for permission they cannot appeal the decision. Bristol had to be extremely detailed in their research and preparation because they could not tweak their proposal later if rejected. It took three years to get from the original impact assessment to submitting the planning application. Cabinet approval for the procurement of a wind farm developer to design, build, operate and maintain the turbines on behalf of the council was given in March 2010. Prior to the announcement of the closure of Filton Airport, the council were working on a technical solution to mitigate any impacts of the turbines on Filton's radar. Following a period of negotiation, contracts were awarded on behalf of the council for the turbine supply and installation, operation and maintenance, and the civil and electrical works for a two turbine wind farm. The windturbine installation is now underway.

Starting year-Duration

2006 onwards

Current situation

Works on site started in April 2013, with erection of turbines due to be completed in September 2013.

Key Performance Indicators

- Installation of two wind turbines at Avonmouth with a combined capacity of 6MW
- Generation of between 9.6 and 12.6 gigawatthours (GWh) annually.

Key stakeholders

- Bristol City Council
- Avonmouth Residents and other residents of Bristol
- Landowners
- Developers
- Statutory bodies e.g. Natural England
- Local airports

A pre-planning public consultation attracted over 250 responses to the survey and a Statement of Community Involvement exists for the project - http://www.bristol.gov.uk/sites/default/files/documents/environment/greener_living/council_plans_for_greener_living/Avonmouth%20Turbines%20Public%20Consultation%20Statement.pdf

The community is extremely supportive of the wind energy plans. In an online survey, 253 out of 255 respondents were in favour of the development. This was in part because a nearby private scheme had already been installed. Initially, there was opposition to the nearby turbines of Bristol Port Authority. But once they were installed, local people felt that their initial concerns about visual amenity were unfounded and in fact residents were proud to have green technology in their area. This meant that local people have faith that Bristol Council's scheme will also be something to be proud of. Community support was also bolstered by a dedicated council communications team.

Lessons learnt

Cover every angle when submitting the planning application. Councils applying to their own planning committee for permission must be prepared for every kind of challenge because they cannot appeal the decision. Evaluate the impact of retiring ROCs and when it may be necessary to do so. Under the current Carbon Reduction Commitment Energy Efficiency Scheme, organisations

cannot claim the carbon credits for generating renewable electricity if ROCs or the feed-in tariffs are claimed. Bristol decided to own the turbines and claim ROCs as that worked out better financially. But they can retire the ROCs if the balance changes.

Cost of the project

The estimated set-up cost is £9.4/11,28€ million. However, that is described as a generous estimate to cover all contingencies. The funding has come from prudential borrowing. It is estimated that the turbines will make £1/1,2€ million each year from Renewables Obligation Certificates (ROCs), Levy Exemption Certificates and selling the electricity. This means it will recoup costs quicker than the normal 25-year borrowing period. Levy Exemption Certificates (LECs) are evidence of electricity supply generated from qualifying renewable sources that is exempt from the Climate Change Levy. The LECs can be redeemed to suppliers, and then in turn to Ofgem, to demonstrate the amount of electricity supplied to non-domestic customers that is exempt from the Levy. All the work leading up to the build has been funded by the council's own self-funded energy management unit. The unit procures energy for the council properties. The unit then recharges their clients internally with a percentage to manage the procurement, bills and any supply issues. The client still gets a better deal on their energy costs as a result. The profits are then used to fund sustainable energy projects.

Energy savings & other sustainable achivements

Bristol City Council will be one of only a small number of local authorities to own wind turbines, and this has made the community proud to be involved in such a ground-breaking scheme. One resident described it as ‘putting Bristol on the map' in terms of sustainable energy.

Generation will be between 9.6GWh and 12.6GWh. This annual production equates to meeting the electricity needs of between 2,000 and 2,700 ‘average' households.

➢EE 9- Bristol Citywide Sustainable Energy Study

Initial Date		**End of submission date**	25/10/2013

Participant name	Bristol City Council
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Field	Sustainable energy production

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	9

Initiative Title (Only public or public-private initiatives)

Bristol Citywide Sustainable Energy Study

Location Map

Covers the entire city of Bristol.

Initiative objectives

The underlying aim of this study was to assist Bristol City Council in developing Local Development Framework (LDF)* policies which positively encourage reduced energy consumption and carbon emissions from buildings and greater sustainable energy generation. The study was produced by the Centre for Sustainable Energy and Adrian Smith, Independent Planning Consultant.

Planning for sustainable energy at national policy level imposes a number of requirements on local authorities to take increased action through the local planning system, and provide greater opportunities to make best use of local resources to maximise sustainable energy implementation.

*The Bristol Local Plan (previously called the Bristol Local Development Framework) comprises a set of local plan documents which contain a range of policies to guide future development decisions.

Initiative description: target areas, technologies

The underlying aim of this study was to assist Bristol City Council in developing Local Development Framework (LDF) policies which positively encourage reduced energy consumption and carbon emissions from buildings and greater sustainable energy generation. This evidence base therefore considered the development of local policies on renewable and low carbon energy generation in the LDF Core Strategy, taking into account anticipated national and Regional Spatial Strategy policies and targets on low carbon energy, sustainable construction, homes and jobs.

The scope of the study also included the identification of sites where there is potential for sustainable energy generation, both on and off-site in:

- new development
- integration of sustainable energy generation with existing neighbourhoods (e.g. where
- urban extensions are adjacent to existing development)
- retrofitting existing buildings

Starting year-Duration

Report was published in June 2009.

Current situation

The Bristol Local Plan is now adopted and is a set of planning documents which contains a range of policies to guide future development decisions.

- Core Strategy – is part of the Local Plan which sets out the overall approach for planning development in Bristol.
- 1997 Adopted Local Plan – contains certain policies that are saved and still used in deciding planning applications.
- Site Allocations and Development Management – will include policies about what sites can be built on and which should be protected from development.
- Bristol Central Area Plan – will guide development in the city centre.

- Joint Waste Core Strategy – guides decisions about where major waste facilities should be built.
- Local Development Scheme – explains what planning policy documents make up the Bristol Local Plan. It also includes a timetable for preparing them.

The city council adopted many of the recommendations outlined in the report. For example the Core Strategy adopted in 2011 contains a policy on climate change (BSC 13) and Sustainable Energy (BSC14) http://www.bristol.gov.uk/sites/default/files/documents/planning_and_building_regulations/planning_policy/local_development_framework/Bristol%20Development%20Framework%20Core%20Strategy%20June%202011.pdf

It also helped to inform projects in development such the establishment of wind turbine at Avonmouth, the setting up of an ESCo and establishing a district 'heat map'.

Key Performance Indicators

Not applicable to this project but see lessons learnt section.

Key stakeholders

Bristol City Council
Centre for Sustainable Energy

Lessons learnt

The report made the following recommendations:

Overarching statement on climate change

To justify and contextualise the development specific policies, an overarching statement should be considered at the outset focused on climate change, CO2 reduction targets and renewable and low carbon energy targets. An overall greenhouse gas reduction target of 80% by 2050 is recommended, in line with the latest UK policy. Citywide targets for renewable and low carbon energy technologies and how they may relate to an appropriate trajectory of CO2 reduction

towards the 2050 target should be the subject of further study and consultation. These should be informed by the results of the renewable energy resource assessment presented in this report.

Site sustainable energy policies

A low carbon energy policy for new residential developments should be included, which sets increasing standards for CO2 reduction in stepped phases up to 2026. The two scenarios tested in this report will offer a range of CO2 savings and the Council's perception of 'undue burden' on developers of the additional cost of low carbon measures will largely dictate which scenarios to take forward. The evidence presented in this report suggests that for an additional 7% increase in development cost between the two Scenarios, there would be a further 28% reduction in emissions from new development, and for this reason the authors recommend that Scenario 2 should be given preference over Scenario 1. However, implementation of either option must involve a degree of flexibility by including an appropriate viability clause to permit a range of 'allowable solutions' to be available to developers where targets can be shown to be unfeasible. In line with Government guidelines, targets should be set using the Code for Sustainable Homes rather than any other criteria, although it should be clear whether the requirement refers to the CO2 emission standards in the Code, or to the whole scope of the Code.

Similar stepped targets should be set for non-residential development, but in terms of BREEAM standards. These targets should be equally challenging, but should be subject to review once the outcomes from the Government's consultation on the Code for Sustainable Buildings are known. Experience from London strongly suggests that policies should include: (1) an explicit energy hierarchy; (2) a requirement for a Site Energy Strategy/Sustainability Statement to accompany development proposals; (3) an on-site renewable energy target; (4) a heating and cooling hierarchy, and (5) explicit clauses to address feasibility and viability issues.

Consistent with the above recommendation, an on-site renewables policy for new developments should be included. The findings of this study suggest that an on-site renewables policy requiring 20% CO2 emissions applied to total residual emissions after the inclusion of energy efficiency, CHP and communal heating measures is appropriate.

Further consideration should be given to material to be included within Development Control DPDs, such as detailed criteria-based policies, additional details on the required structure and content of Site Energy Strategies submitted as part of a Sustainability Statement accompanying planning applications, and details on any 'allowable solutions' offered to developers. These should include increased flexibility to encourage the development of district heating in the Heat Priority Areas. All targets and standards should be revised and updated periodically as national policy, sustainability best practice and low and zero carbon technologies develop.

Sustainable energy projects

There is a case for a policy setting out a vision for sustainable energy and including key specific projects – heat networks, larger scale renewables, new build applications and retro-fitting. To support this, site and area specific proposals for sustainable energy should be added to the

proposed policies and supporting text. These should include reference to identification of 'Heat Priority Areas' as described in this report, where district heating using CHP/CCHP as part of a citywide network is likely to offer opportunities to set higher standards in an earlier phases and so should be encouraged/required.

Sustainable design and construction

Although the focus of this study concerns sustainable energy, the broader scope of environmental benefits resulting from sustainable design and construction also needs to be considered. Areas such as water use, the life cycle of materials, biodiversity, waste recycling and sustainable drainage systems are covered within the Code for Sustainable Homes and BREEAM, so unless otherwise specified, the use of these standards to express CO2 emissions targets will also imply certain standards for other aspects of sustainable design and construction. It is recommended that a policy on sustainable design and construction is expressed using these standards alongside a general checklist to highlight the main areas of focus. The viability of Code level 6 should be reviewed following the Government's consultation on the definition of zero carbon homes.

Energy strategy priorities

Bristol City Council should focus its energy strategy on developing the key resources of waste and biomass (woodfuel) to supply larger scale heat or CHP/CCHP plants serving what should ultimately be a citywide district heat network in the city's Heat Priority Areas. These resources, and to a lesser extent gas-fired CHP, have the potential to play a key role in meeting the challenging targets up to and beyond 2016, and could be instrumental in achieving substantial citywide emissions reduction targets in line with those recommended above. As an urban area, Bristol's woodfuel resource is constrained and it should therefore build on existing experience in sourcing woodfuel and encourage the development of local fuel supply chains from outside the city.

Bristol City Council as delivery partner

The strategic position within the community held by Bristol City Council provides an opportunity to facilitate multi-sector partnerships – especially for large scale mixed-use developments, where renewable energy infrastructure may be shared, or where Energy Service Companies (ESCos) may be involved to potentially reduce the additional capital cost burden.

Bristol City Council forms part of the West of England group of local authorities and hence should consider working alongside North Somerset Council, South Gloucestershire Council and Bath and North East Somerset Council in regard of opportunities for sustainable energy. This is already occurring with waste management through the identification of sites incorporating energy recovery from waste but could also include assessing the opportunities for biomass supply chains and sustainable energy supply strategies for cross-boundary urban extensions

Avonmouth

Due to its predominantly industrial land use and excellent transport connections, the Avonmouth area holds significant potential for large scale low or zero carbon energy generation such as wind and biomass plant. A more detailed local study on building energy use in the area and local heat

and power demands is suggested to evaluate the potential for CHP/CCHP plant possibly powered by biomass. It is unlikely that connection to City Centre heat loads would be economic in the short term, although this could emerge in the longer term as a citywide heat network develops. Avonmouth's wind power resource should continue to be developed as far as possible.

District Heating

A strategic planning study on a citywide heat distribution network should be undertaken as soon as possible. The initial phase of a network is likely to be kick-started by a major new development with opportunities for a CHP/CCHP plant site – such as the proposed redevelopment of Southmead Hospital – and should also involve the provision of heat to nearby existing development, most likely within the Heat Priority Area. The study should also assess operational and delivery issues and the potential for ESCO partnerships, learning lessons from recent experience and current practice in London, where the London Development Agency is setting an ambitious agenda for the development of 'Energy Masterplans' for all London boroughs.

Cost of the project

Cost of study – £25,000/30.000€

Energy savings & other sustainable achievements

The research informed the development of climate change and sustainable energy policies in Bristol's Local Plan and the development of the associated sustainable energy projects and initiatives in the city.

➢EE 10- Bristol Green doors

Initial Date		**End of submission date**	25/10/2013

Participant name	Bristol Green Doors (Centre for Sustainable Energy)
E-mail	Martin.holley@cse.org.uk
Field	Energy efficiency

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	10

Initiative Title (Only public or public-private initiatives)

- Bristol Green Doors

Initiative objectives

To promote the uptake of low carbon improvements in residential properties and thereby increase the energy efficiency of housing stock. Additionally the initiative provides an opportunity for people to learn more about the latest government schemes concerning energy efficiency such as the Green Deal.

Initiative description: target areas, technologies

The scheme operates by running open home days, in which volunteers who have made carbon-saving retrofit measures to their homes share their experiences with others to demonstrate how they work in practice and discuss the benefits they have experienced since the renovation. By sharing personal stories in this way visitors gain in-depth knowledge regarding the installation process, subsequent cost savings and improved quality of living.

The scheme operates at a city level; similar schemes had been run in other cities previously but Bristol created one of the largest events of this kind and has since contributed to the Energy Savings Trusts organisers guide on open home events due to recognition for its excellent example.

A wide range of technologies are covered due to the personal choices and priorities of home-owners in addition to the number of properties included in each event. Examples include solar panels, solid wall insulation and draught-proofing although as future events may include more variety as more homeowners decide to become involved.

Starting year-Duration

1st event held in September 2010.

2 events were held in 2011 in March and June, one focused on insulation the other on solar

2nd city wide event held in September 2013

Current situation

Following the success in Bristol, CSE has attended several road-shows around the country and set up an online hub to freely share resources and advice with local groups on how to run and publicise similar events that show off homes with energy saving improvements in their communities.

For the last event, Bristol Green Doors worked with Bristol University to create a mobile phone app to better engage people with the event. This will be hopefully be used at future events and if successful could be shared with other groups around the UK.

Key Performance Indicators

- Following processing of feedback forms from visitors which included 32% of those who attended; 96% of people described the first event in 2010 as “a good way to learn” 85% said they felt more aware of what practical energy saving home improvements could be made and 70% said they were “more likely to install related solutions” as a result of attending.

Key stakeholders

- Bristol Green Doors, Department for Energy & Climate Change, Forum for the Future, National Trust, Transition Network and The Association for Environment Conscious Building

Lessons learnt

- The most important message from the feedback received was how much visitors valued the direct householder contact.

The survey also revealed that the majority of respondents tended to display relatively privileged social characteristics being predominantly white and middle class. There was additional feedback that more low-cost energy retrofitting measures would be well received that may appeal to wider sections of society.

Most respondents visited more than one home which demonstrates a genuine interest in finding out about a variety of retrofit measures. However follow-up events were poorly attended by respondents meaning it is important to provide the opportunity for visitors to access information on the day.

Bristol Green Doors raised awareness which in turn empowered visitors to act and led to high numbers stating their increased level of intention to undertake low cost improvements in their own home. Many visitors therefore were those interested in assessing their options rather that needing to be 'converted' to the principals of retrofitting as a concept. Respondents reported that they would favour a local independent trader to carry out work in their own home although recommendations from Bristol Green Doors made little impact on choice.

➢EE 11- Bristol Home Energy Upgrade

Initial Date		**End of submission date**	25/10/2013
Participant name	Martin Holley, Centre for Sustainable Energy		
E-mail	Martin.holley@cse.org.uk		
Field	Energy efficiency		

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	11

Initiative Title (Only public or public-private initiatives)

Bristol Home Energy Upgrade – A retrofit programme to trial the Green Deal

Initiative objectives

The Bristol Home Energy Upgrade was a pilot scheme, part of Bristol's strategy to develop a £100m plus programme of commercially viable renewable energy and retrofit projects. The aim was to test the underlying principles of the latest national government energy efficiency schemes, the Green Deal and Energy Company Obligation (ECO) by replicating the experience as closely as possible. This included utilising the emerging Green Deal supply chain (installers, advisors) and pay-as-you-save style finance. Bristol Home Energy Upgrade aimed to drive early demand for the two initiatives by funding a number of free home assessments and encouraging the uptake of eligible measures in the private domestic sector. In addition, the pilot sought to develop a practical perspective of the realities of Green Deal and ECO policy.

Initiative description: target areas, technologies

The pilot focused particularly on solid wall insulation and boiler upgrades but the nationwide Green Deal includes a range of eligible technologies. However, as the scheme is driven by market forces in practice it will is the most cost effective to install measures that will be used most often.

Starting year-Duration
December 2012 – March 2013 (report completed September 2013)

Current situation
The Green Deal and ECO are now fully functioning at the national level; as the final results from this particular project were published very recently it is too soon to tell how influential the results will be as the schemes progress.

Key Performance Indicators
The project focused on qualitative data to gain insight into how the Green Deal and ECO operated in practice. The key performance indicators looked at the experience of both customers and installers using the scheme to determine what improvements are most needed going forward. Overall the aim was to gain a broader understanding of the drivers and disincentives in relation to the Green Deal and ECO, both from the perspective of the householder and the industry.

Key stakeholders
Bristol City Council, Department for Energy & Climate Change (project funder) and Scottish & Southern Energy.

Lessons learnt
A significant number of referrals and applications came from Bristol City council which highlights the importance of working with a local authority as a trusted source of information. The scheme found a need for greater simplification to limit the need for excessive amounts of time and effort from home-owners to ensure successful completion. Equally important is providing participants

with impartial advice regarding their options so they do not feel pressurised into taking a particular route that may not be right for them.

Cost of the project

The project involved approximately 15 members of staff over a 6 month period with final costs in excess of £100,000/120.000€. Staff time focused on providing information about the scheme and guiding customers through the process from start to finish with a smaller amount of time allocated to research, monitoring and evaluation.

Energy savings & other sustainable achivements

The scheme achieved 157 home installations which in total equates to an estimated lifetime fuel bills savings of £585,415/702,498€ and carbon savings of 3,786 tCO2. This takes into the expected lifetime of a heating system as being 12 years and 36 for solid wall insulation.

➢EE 12- Warming Bristol Communities

Initial Date		**End of submission date**	25/10/2013

Participant name	Martin Holley, Centre for Sustainable Energy
E-mail	Martin.holley@cse.org.uk
Field	Energy efficiency
Initiative number	12

Initiative Title (Only public or public-private initiatives)

Warming Bristol Communities – Helping disadvantaged members of Bristol's ethnic minority Community at risk of fuel debt

Initiative objectives

To reach 1,500 people from black, Asian and other minority ethnic BAME communities across Bristol to ensure they have a working knowledge of energy efficiency and can keep their homes adequately heated, insulated and safe. This includes providing in-depth support to 700 people who will be able to report warmer, less damp homes and improved well-being by the end of the project.

Initiative description: target areas, technologies

Warming Bristol Communities aims to improve the lives of people BAME communities in Bristol who are living in cold, damp homes, struggling to pay fuel bills or at risk of falling into arrears. Around 10% of Bristolians are from BAME communities with around 16,000 of Somali original. The project has 14 active volunteers from relevant community groups who work alongside CSE to deliver energy advice in the house-holders in their first language. By raising energy awareness, including a working knowledge regarding billing and heating controls which can be completely unknown

concepts to those who are new to the country, the project helps those already struggling with fuel debt and reduces the risk of more people falling into fuel poverty.

Starting year-Duration

January 2010 – December 2013

Current situation

In total 45 advice surgeries have been held by the project to date with efforts concentrated on a monthly surgery, held in the same location each month which is now very well know within the local community and exceptionally well attended. In December of last year and for the winter months of this year the frequency of surgeries will be increased to twice a month to meet the high demand over the winter period. We will, therefore have exceeded the target number of advice surgeries by the end of the project.

As volunteer advisors' knowledge and confidence has grown they have increasingly attended local community events on their own, attending a total of 20 on behalf of the project to date. Volunteer advisors have additionally participated in 411 different activies as representatives for the project. Embedding the volunteers within the project team has enabled us to maintain closer links with partner organisations, including those that are members of the steering group. Volunteers are often also volunteering for these other organisations and provide a means of regular communication.

The provision of practical draught-busting workshops, with the free provision of draught-proofing materials has been very successful. Further workshops should lead to tartgets being met, if not exceed as intended by the end of the project. Draught proofing and DIY insulation has enabled us to benefit tenants where formal grant insulation schemes require the cooperation of landlords which is not always forthcoming.

Key Performance Indicators

The targets relating to energy education were successfully completed during year two, work in this area is ongoing to maintain good levels. There are several other milestones for this project which have been met so far including:

Beneficiaries referred to other agencies 392 (target 300)

Beneficiaries provided with information 1383 (target 1000)

Home visits 321 (target 160)

Activities delivered by trainee advisors 411 (target 187)

Activities delivered by trainee advisors independently 20 (target 16)

BME households given energy advice as result of schools work 49 (target 30)

BME advisors trained in energy advice 16 (target 10)

Key stakeholders

The Big Lottery and Comic Relief (project funders). Bright Project, Bristol Debt Advice Centre, Citizens Advice Bureau, Dhek Bhal, Humdard, Single Parent Action Network, Somali Advice Project, Somali Resource Centre, St Pauls Advice Centre

Lessons learnt

Language and literacy barriers in addition to different cultural attitudes proved a significant challenge to monitoring outcomes in target groups including limited success in achieving completed follow up forms. The low return rate is also attributed to beneficiaries not being accustomed to this type of activity. Telephone follow up is limited by the time that volunteers with the relevant language skills can make available. We have offered a £5 supermarket voucher which has increased response rates (it is notable that as £5 is an effective incentive this is indicative of the levels of poverty generally within our beneficiary group).

To overcome these barriers and ensure adequate monitoring data there are plans for an evaluation event with beneficiaries which will include energy saving giveaways as an incentive for attendance. This will generate in-depth qualitative data through one-to-ones as well as increasing the number of completed questionnaires.

Cost of the project

See table

	Total project costs – include VAT where applicable (£)/(€)				(£)/(€)
	Year 1	Year 2	Year 3	Year 4	**Total**
Revenue costs	-	-	-	-	-
Salaries, National Insurance and Pensions	39,487/ 47,384	52594.68/ 63113.62	33,202/ 39,842	5/6	124012 / 148814
General running expenses	128.64 / 154.37	850 / 1020	850 / 1020	600 / 720	2,380 / 2856
Training	462.76 / 555.31	-	-	-	1,000 / 1,200
Travel	901.76 / 1082.11	1,436 / 1,723.2	920 / 1104	80/ 96	2,890 / 3,468
Consultancy and advice	6271.49 / 7525.79	10250 / 12300	18,581 / 22,30	1,962 / 2,3544	47,661 / 57,193
Leaflets (p+p, plus translation costs)	1,904.36 / 2,285.23	1000 / 1200	-	-	2,500 / 3,000
Project outreach (launch, venue hire etc)	743.31 / 891.97	800 / 960	300 / 360	-	1,400 / 1680
Total revenue costs	49,899.32/ 59,879.18	66,930.68 / 80,316.82	53,854 / 64,625	11,161 / 13,393	181,845 / 218,214
Overheads	-	-	-	-	-
Staff	16,001/ 19,201	8,044 / 9,562	7,982 / 9,578	3,414 / 4,097	35,441/ 42,529
Accommodation	3,972/4,766	3,711/4,453	3,571/4,285	401/481	11,656/ 13,978
Utilities	768 / 922	791/949	815/978	839/1007	3,213/3,856
IT	227/272	175/210	180/216	25/30	606/727
Facilities	553/664	427/512	440/528	61/73	1,481/1,777
Total overheads	21,520/25,824	13,148/ 15778	12,988/ 15,586	4,740/ 5,688	52,397/ 62,876
Total project costs	71,419.32/ 85,703.18	80,078.68/ 96,094.42	66,842/ 80,210	15,901/ 19,081	**234242/ 281090**

➢EE 13- Older People's Energy Network project (OPEN)

Initial Date		**End of submission date**	25/10/2013
Participant name	Martin Holley, Centre for Sustainable Energy		
E-mail	Martin.holley@cse.org.uk		
Field	Energy efficiency		
Initiative number	13		

Initiative Title (Only public or public-private initiatives)
Older People's Energy Network project (OPEN)

Initiative objectives
The project aims to improve the well-being of older people living in fuel-poverty in Bristol and the South West. This will be achieved by working in partnership with existing community groups and agencies that focus on this particular section of society. CSE will train keen volunteers who are themselves over 50 years old to work alongside CSE advisors and provide householders with in-depth energy advice. By creating a peer to peer service advice comes from a trusted source from within the householder's community which is more likely to inspire confidence and necessary action.

Initiative description: target areas, technologies
Older people are at greater risk of fuel poverty than other age groups for the following reasons; They need better advice and support to stay warm at home, with local user-led groups supporting and identifying members/clients suffering from fuel poverty.

Older people in fuel poverty are less likely to participate in their community.

To ensure older people receive the support they need trainee advisors will learn a wide range of energy related topics, the main ones being:

- Heating – types of heaters and boilers
- Heating Controls
- Appliances
- Insulation
- Condensation and dampness
- Glazing
- Dealing with fuel debt
- Fuel tariffs
- Behavioural changes
- Grants

This will be learnt through receiving energy awareness training but primarily from shadowing CSE advisors on home visits and at events.

Starting year–Duration

Jan 2012 – ongoing (3 year project)

Current situation

This is the second time this is project has run meaning there was significant experience to draw from going forward. In the first three years of the project a number of recruitment drives were held to recruit volunteers to work in defined areas. This was followed up with comprehensive training including fully accredited City & Guilds Energy Awareness and NEA. Volunteers met on a monthly basis to plan an advice strategy for their local area and discuss the activities already completed. Volunteers were encouraged to develop their own work plan to tailor it to their specific community with support from CSE staff and resources. Meetings are currently held every six weeks to touch base with CSE and discuss future developments.

Key Performance Indicators

OUTCOME 1: Improved wellbeing and independence of older people on fuel poverty in the West of

England.
Target for the end of the project: 1,500 older people
2nd year result (so far): 427 older people

OUTCOME 2: Increased volunteers' individual sense of worth, interest and participation in reducing fuel poverty in their community.
End of 2nd year and target for the end of the project: 35 volunteers
2nd year result (so far): 16 volunteers

OUTCOME 3: Organisations that support target group are better informed, have improved energy advice skills resulting in more older people being supported.

Target for the project: 500 staff/volunteers from partner organisations

2nd year result (so far): 241 staff/volunteers from partner organisations

OUTCOME 4: Older people are more confident and improved life skills being better able to manage their energy use and costs

Target for the end of the project: 2,700 older people
2nd year result (so far): 1,373 older people

Key stakeholders

Knightstone Housing Association (KHA) and Community Service Volunteer (CSV), Environmental Action Fund, South Western Electricity, RSVP, community groups in North Somerset

Lessons learnt

Successful recruitment of volunteers has had varying levels of success, largely depending on location. The most successful occurred in areas where local people feel a sense of 'community spirit' and where a strong volunteer ethic already existed.

Cost of the project

TOTAL COST BREAKDOWN			
Revenue	Year 1	Year 2	Year 3
Salaries, NI and Pensions	£66,329	£77,769	£57,299
General running expenses	£3,500	£2,400	£1,250
Training	£0	£900	£900
Travel	£2,100	£3,900	£2,560
Consultancy & advice	£6,600	£9,641	£8,593
Total Revenue	£78,529	£94,610	£70,602
Overheads			
Staff	£10,011	£11,933	£8,597
Accommodation	£4,691	£5,539	£4,057
Utilities	£3,298	£3,894	£2,852
Total Overheads	£18,000	£21,365	£15,507
Capital			
Total Project Costs	£96,528	£115,975	£86,109
CSE staffing costs	Year 1	Year 2	Year 3
Salaries, NI and Pensions	£66,329	£77,769	£57,299
Total Overheads	£18,000	£21,365	£15,507
	£84,328	£99,134	£72,806
NOTE: CSE staff time = Sal, NI & Pens + Overheads			
CSE direct costs	Year 1	Year 2	Year 3
General running expenses	£3,500	£2,400	£1,250
Training	£0	£900	£900
Travel	£2,100	£3,900	£2,560
Consultancy & advice	£6,600	£9,641	£8,593
	£12,200	£16,841	£13,303
Total project costs	Year 1	Year 2	Year 3
	£96,528	**£115,975**	**£86,109**
Total project costs		**£298,613**	

➢EE 14- ZERO VOLUME

Initial Date		**End of submission date**	04/11/2013

Participant name	MUNICIPALITY OF FLORENCE
E-mail	pattodeisindaci@comune.fi.it
Field	

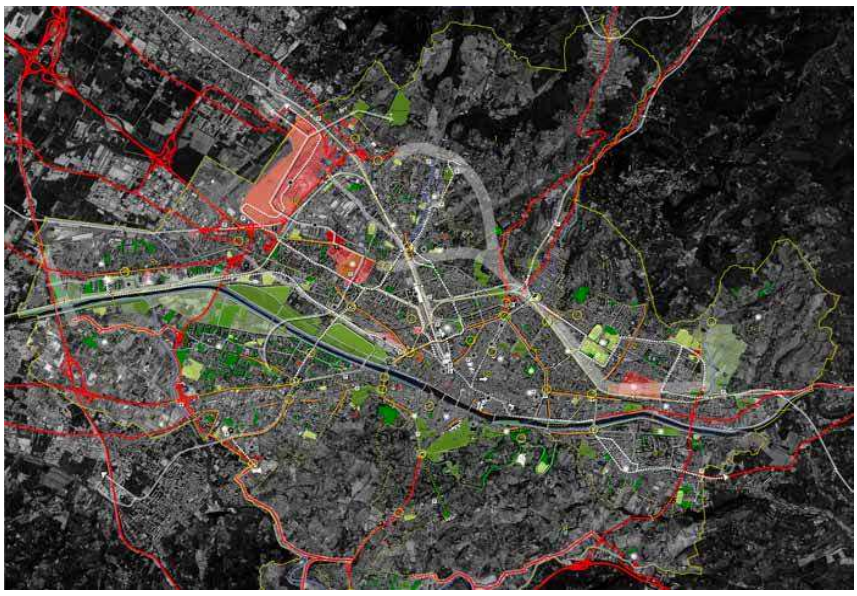
☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	14

Initiative Title (Only public or public-private initiatives)

ZERO VOLUME

Location Map



The city of Florence

Initiative objectives

The essential aim is to limit the use of land and the increase in the volume of construction in the municipal area. More than limit, at the base of the evaluation process carried out during the path of formation of the structure plan, was taken a radical decision eliminating all forms of exploitation of new soil.

The Structural Plan non-renewal in fact the remnants of the PRG, or forecasts of areas of new construction for residential, manufacturing and services not yet implemented that add up to about 140,000 square meters. The only prediction retained is derived from long legal disputes that have saw the municipal administration unsuccessful.

The constraint placed will result in a re-use of available volumes resulting in regeneration also in terms of energy and the environment.

With the adoption of the Structure Plan, the City has undertaken a process of urban renewal throughout the country centered on the principle of zero volume, in the next few years, in fact the new buildings will be possible only to replace as many volumes considered inadequate by today's standards or characteristics of the territory.

The Structure Plan therefore provides a substantial redevelopment of existing buildings with a significant improvement in energy and environmental performance also.

Initiative description: target areas, technologies

Structure Plan in respect of town planning introduces the concept innovative use of "zero volume" effectively blocking the increase in buildings and identifying methods of equalization redevelopment and displacement respectively of historic buildings and incongruous not used. The demographic pressure of the municipal area is high, with its 3,571 residents per square kilometer (compared to a provincial average of 280) Florence is the Municipality of central Italy with the highest density of population.

In the structural plan, were developed the following 4-invariant where is applied the concept of "zero volume":

- Rivers and valleys
- The hilly landscape
- The historic core
- The historical fabrics and relationship with the hilly landscape

In the four invariant set is always permitted replacement housing/urban renewal for buildings or complex of buildings that deems planning rules being inconsistent with the context and they constitute the fact elements of degradation.

Within formation of a morphologically defined, it has been defined the isolated buildings that demonstrate an absolute incongruity with respect to the context ordered the building along the street, typical of the block, and if it also allows the demolition with reconstruction. The Structure Plan introduces, with the primary goal of eliminate degradation conditions prevalent in the city, the principle of transfer of land unsuitable after making a general reflection on the problem of clogging of the isolates. In order to achieve the primary objective of eliminating areas of degradation and start quickly processes of urban and environmental planning rules may provide for the establishment of the "register of building loans". Urban quality will be improved thanks to the use of equalization according to the principle for which the owners, regardless the specific targets the Town Planning Regulations assign, participate, in proportion to ownership held, the expenses resulting from the implementation of the allocations territorial aimed at the achievement of quality objectives Urban.

The Structure Plan states that as a rule in the interventions subject to transformation implementation plan must be sold 50% of the land area to be devoted to the finding of standards and the necessary infrastructural facilities .

Starting year-Duration

2011-2020

Current situation

The Structural Plan has been approved on 2011 and the and the urban bylaw, which includes the recommendations of the plan, is scheduled for adoption by December 2013

Key Performance Indicators

- building practices and energy certificates
- consumption construction industry

Key stakeholders

associations(manufacturers, installers and craftsmen owners)

Orders Professional Designers (engineers, surveyors)

Lessons learnt

Be in contact with citizens and inhabitants in order to share the vision at the base of the plan. Make people aware of the choices you have made, share them through a participatory process, and incorporate the suggestions, "always taking the reins in hand".

No more time to wait neither to waste.

Cost of the project

The estimated cost and approximate is made on the basis of the following estimates: 9,286 accommodations (75/accomodation square meters) for a total of 27,860 inhabitants to be set up 63,600 sq m to be allocated to productive activities; 62,430 sq m to be allocated to commercial area in medium sales structures; 23,950 sq m to be allocated to tourist facilities; 61,620 sq m to be allocated to activities including directional private service 50,000 square meters, the outcome of urban equalization and is equal to euro 750.000.000

Energy savings & other sustainable achivements

In total the calculation provides an energy saving amounted to 396,648 MWh/year resulting in reduction of CO2 emissions by 80,123 t/year.

5.2 Mobility

➢MOB 1- Traffic Supervisor

Initial Date		**End of submission date**	04/11/2013
Participant name	MUNICIPALITY OF FLORENCE		
E-mail	pattodeisindaci@comune.fi.it		
Field			

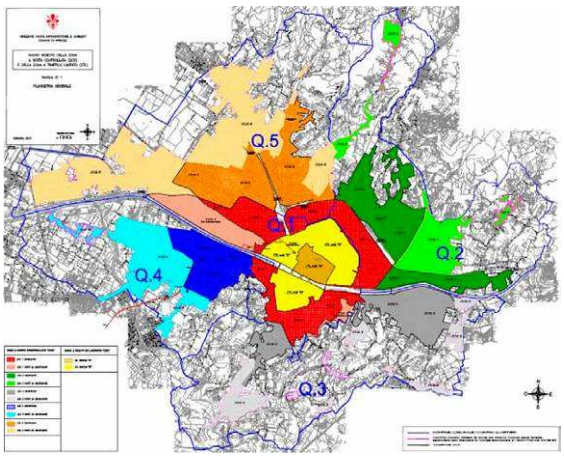
☐ ICT´s ☒ Mobility ☐ Energy efficiency

Initiative number	15

Initiative Title (Only public or public-private initiatives)

TRAFFIC SUPERVISOR

Location Map



THE CITY OF FLORENCE

Initiative objectives

If you look at a map of the road infrastructure of the city of Florence, it is clearly a complex infrastructure design, become worse by the lack of a ring of outer able to make sense of the whole pattern of the city road network.

The commuters from the suburbs in the morning go to work in the center have almost no choice apart to wait for the overcrowded buses. These make their way with difficulty in the dense mass of vehicles on the avenues of the ring and are caught in the narrow alleys of the center. Those who live in the vast suburbs and work there too, does a dual path. By bus or by car, must make his way towards the city center . Here then uses the ring, only to find the road that brings him back to the suburbs to his job. In this way the crashing waves of the traffic on the ring road of the city and are refracted back out because this is the only artery of the city that allows you to switch from one to another arterial road , and only a semicircle. In this context , the platform of traffic management (traffic supervisor) aims at a better capacity to govern traffic by agencies charge and a smooth flow of traffic through a solution is not invasive or infrastructure . The city traffic, also thanks to others actions related to traffic reduction, will be the subject of interventions of fluidization through the realization of a modern central management can provide real-time indications of criticality and alternatives connected to the existing information portal accessible to the public (TO-GO on the web and panels bright variable message signs).

Initiative description: target areas, technologies

The integrated platform for traffic management is mainly composed of two modules: Supervisor of Traffic: the traffic supervisor is a system for control and centralized management of traffic and allows the identification of the state of current traffic on the network and the prediction of the future state in the short and long term.

Infomobility platform: the mobility platform is a system that is fully integrated with the supervision of the traffic, this consists of a portal for the dissemination of information to the public (calculation multimodal routes, schedules, etc.) and allows the end user a optimal route planning in relation to events or delays promptly reported on the graph road. The platform also allows the calculation of the path intermodal private / public in such a way as to strengthen and promote the use of public transport vehicles with reduced environmental impact.

Starting year-Duration

2011-2015

Current situation

The project is ahead of schedule (2015), pending the final validation of the system.

Key Performance Indicators

- access platform intermodality / nr
- average speed (km / h)

Key stakeholders

citizens
transport companies

Lessons learnt

Information is fundamental in manageing and planning the mobility system.

Cost of the project

The cost of the project is euro 600.000,00

the amount is from the beginning and with the estimates of expenditure of 2013

it does not include the cost of staff

Energy savings & other sustainable achivements

The estimated value of the reduction in emissions CO2 is 46.700 tons

➢MOB 2- Sustainable Mobility of citizens

Initial Date		**End of submission date**	04/11/2013

Participant name	MUNICIPALITY OF FLORENCE
E-mail	pattodeisindaci@comune.fi.it
Field	

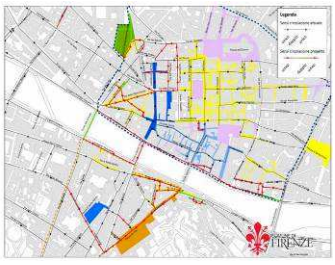
☐ ICT´s ☒ Mobility ☐ Energy efficiency

Initiative number	16

Initiative Title (Only public or public-private initiatives)

SUSTAINABLE MOBILITY OF CITIZENS

Location Map



Initiative objectives

Florence suffers from mobility. The first regeneration that the city needs is related to transportation. The trend must be reversed not only to restore quality of life to citizens, but

especially to safeguard one of the most extraordinary heritage of humanity. The metropolitan area around Florence is the fifth largest one in relation to the requirements of Italian mobility, after Rome, Milan , Naples, Turin and Bologna with .

The number of daily trips in this area is huge, estimated at 690,000. The city of Florence is at the center of this vortex: the total number of cars circulating in Florence in a weekday morning is about 100,000, two-thirds of workers are students or other third shifts for different reasons. Italy holds the world record of private cars par person (corresponding to 1.66 persons per car in 2009) and 36.4 million vehicles circulating that cover about 13,000 km / year (26% more than the EU average).

The City of Florence in 2005 was already an fleet with 1.83 persons per car and with a high number of motorcycles than the national average. The limitation of traffic areas and parking are aimed to reduce private transport passengers and enhancing the efficiency of the private car park.

The municipality wants to achieve these goals through a series of actions related (eco road pricing policy, ZTL even at night , the park plan and pedestrian areas, car-free days and flanking measures promotion of public transport) able to generate a reducing vehicle traffic by changing user habits city or improvement of environmental externalities due to private traffic through the modernization of circulating vehicles .

The action to safeguard the immense heritage of Florence and the health and quality of life of its inhabitants, which looks at the "pedestrianization" of the Cathedral as his baptism made in 2009, to be continued with the regulation of circulation in the most fragile areas and congested near the historic center and in the consolidated city.

The idea is to creeate eco systems road pricing, the resources of which will feed into the implementation of large-scale infrastructure necessary for the survival of the city.

Initiative description: target areas, technologies

The action consists in a set of related measures, aimed at more sustainable approach towards mobility by both of a citizen of the host.

In particular, the main line of action consists on the one hand in pushing technological modernization of the vehicle fleet private assets and the other in the promotion of mobility pedestrian and public transport.

Starting year-Duration

2009-2020

Current situation

The plan of new pedestrian areas is in line with what was expected and even better. Florence is currently the most pedestrian of Italy at all, as an extension of the affected areas amounted to 396

thousand square meters. Then when you take into account the relationship between square meter and the result is even more inhabitant net: 1.07 sqm for handsome, more than double of the second city.

Some delays are recognized in the timing on the implementation of park and ride and the strengthening and replacement of the fleet of public transport and fleet administration (delays regarding the current economic situation and national provisions related to the law the so-called spending review).

Eco road pricing policy is adapting and updating.

Key Performance Indicators

- pedestrian areas and ZTL/par Km2
- private vehicle fleet replaced with low-emission vehicles (i.e. electrical car / bike / motor) / nr
- replacement public vehicles / nr
- park and ride / nr
- public fleet /nr (new and/or replaced)

Key stakeholders

citizens
transport companies
associations

Lessons learnt

A structural and strategic operational plan involving various actions makes the results of each action strengthened. The synergistic relationship has a multiplier effect that stimulates the further implementation and testing of shares.

The good example of the public is a major asset for the involvement and the adjustment of the private key to achieving significant results.

Sometimes, impose a choice is needed to prove the correctness of the same.

Cost of the project

The general cost of the project is the sum of the actions connected to the indicators :
- euro 2.700.000 for park and ride
- euro 1.250.000 for pedestrian areas and ZTL (limited traffic zone)

- euro 2.240.000 strengthening alternative mobility (public fleet)

- euro 3.746.345 private vehicle fleet replaced with low-emission vehicles (i.e. electrical car / bike / motor) - incentives and locations of refills

- euro 1.163.000 replacement public vehicles (municipality)

the amount is from the beginning of the each single project and with the estimates of expenditure of 2013

Energy savings & other sustainable achivements

The estimated value of the reduction in emissions CO2 following the application of the above measures for sustainable transport turns out to be 138200 tons per year to 2020 divided as follows:
- expansion ZTL, eco road pricing and consequent private vehicle fleet modernization = 132000 tons
- pedestrianization and traffic closures = 1200 tons plan the rest (except for park and ride) = 5000 tons

➢MOB 3- Sustainable mobility

Initial Date	20/10/2013	**End of submission date**	25/10/2013

Participant name	Ayuntamiento de San Sebastián
E-mail	Maria_azurmendi@donostia.org
Field	Mobility

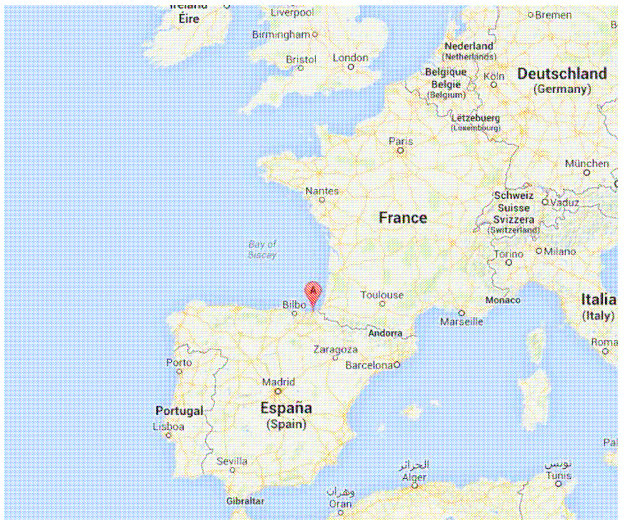
☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	17

Initiative Title (Only public or public-private initiatives)

Sustainable Mobility

Location Map



Initiative objectives
The general objective is to move towards a sustainable mobility in San Sebastián.

Initiative description: target areas, technologies			
PROJECT	PROGRAM	PARTICIPANTS	DESCRIPTION
CYCLELOGIS-TICS AHEAD	IEE call	Cambridge, Mechelen, Donostia, Berlin, Milan, Praga, Budapest.	The aim of this project is to reduce the emissions and energy consumption from the freight transportation. To achieve this the project intends to support the creation of freight transportation companies which use almost zero emissions vehicles as it happens with the freight transportation with bicycles.
SWITCH	IEE call	Antwerp, Gdansk, London, Donostia, Vienna, Alemania, Rumanía, Eslovenia.	This project tries to reduce the motorised traffic by switching the local short rides to walking or bicycle rides. This is applied to different groups of citizens with different needs.
TIDE	7 FP, SST 3.1.3.	Reading, Rotterdam, Budapest, Donostia, Milan	Deals about the implementation of two innovative measures concerning non motorised mobility
SITE	INTERREG. 2007-2012 Atlantic Area Programme.	Nantes, Donostia, Gijón, Liverpool, Aveiro, Dun Loaghaire-Dublin.	This project tries to solve problems that arise when the cities try to improve the ticketing by different means, as the installation of intelligent machinery, systems and integrated transportation tickets. The Coordination-Evaluation of this project falls to Donostia San Sebastián City Council
SMARTCEM	ICT PSP fifth call for proposals	Barcelona, Reggio Emilia, Newcastle,	This is a project to study the behaviour of the electric vehicle users.

	2011	Gipuzkoa	
QUEST	Intelligent Energy Europe	-Donostia, Gante, Padua, Gävle (SWE),Bath	This project intends to develop an auditing tool for the evaluation and improvement of the quality of the sustainable urban transportation system. After a QUEST auditory the city receives the certification on recognition of the efforts made by the city council in this field.
AENEAS	Intelligent Energy Europe	Odense, Salzburgo, Muchich, Cracovia, Donostia	The aim is to promote the sustainable mobility among the elder. Several workshops have been made to to promote suatainable mobility to the elders of the city : 10 road safety workshops, 7 public transportation workshops and 20 walking promotion workshops.
CIVITAS ARCHIMEDES	Donostia, Usti nad Labem, Iasi, Monza, Brighton, Aalborg	This project tries to promote the sustainable mobility in the city with a lot of different actions: Support of biodiesel consumption, alternative parking, oil recycle, street parking system in a new neighbourhood, design of 200 personalized plans to avoid the use of private car and support of the public transport, design and implementation of 30 km per hour areas, approval of the covenant for the road safety, Car sharing system implementation, vertical mobility systems constructed (street elevators) development of tools and policies to improve the local freight distribution implementation of new information pannels for the bus drivers, mobility management in the University campus.	

Starting year-Duration		
CYCLELOGIS-TICS AHEAD	May 2014	May 2016 (24 months)
SWITCH	May 2014	Mayo 2017 (36 months)
TIDE	September 2012	September 2015 (36 months)
SITE	January 2012	June 2014 (30 month)
SMARTCEM	January 2012	December 2014 (36 months)

QUEST	May 2011	November 2013 (30 months)
AENEAS	August 2008	May 2011 (34 months)
CIVITAS ARCHIMEDES	October 2008	October 2012 (48 months)

Current situation

Aeneas, Quest and Civitas Archimedes projects are finished. The others are on the go.
This three past years have been positive for the sustainable mobility in the city.

Key Performance Indicators

Percentage of non motorised trips versus motorised.
CO2 emissions.

Key stakeholders

- SS municipality and its personnel.
  - Citizens
  - Policy makers
  - DBUS local transport company
  - DBICI local transport company
  - Mobility related enterprises.

Lessons learnt

The citizens are generally well informed about public transportation systems in the city and are switching to public sustainable ways of mobility for the short distances (less than 600 meters). There's also a switch for longer distances but there's still a lot of work to be done even that the path towards sustainable transport is already well defined.

Cost of the project		
PROJECT	TOTAL BUDGET	SUSIDIZED COSTS FOR THE COUNCIL
CYCLELOGIS-TICS AHEAD	2.340.066 €	128.000 € (73,04%)
SWITCH	1.690.072 €	104.042 € (73.62%)
TIDE	2.144.407 €	81.962 € (100%)
SITE	6.637.300 €	166.664 € (65%)
SMARTCEM	2.450.000 €	44.400 € (50%)
QUEST	2.166.000 €	19.950 € (70%)
AENEAS	1.820.103 €	180.230,00 € (67 %)
CIVITAS ARCHIMEDES	6.787.271 €	1.653.409,00 € (64 %)

Energy savings & other sustainable achievements
All this projects are supposed to decrease the number of trips, hence decreasing the demand of energy and produced emissions in some extension, this has been achieved, but some of the decrease on the number of motorised vehicle trips and increase on the number of sustainable transport trips can be explained by the economical context.

5.3 ICT´s

➢ICT 1- ICT infrastructure Manager

Initial Date	30/06/2010	**End of submission date**	On going

Participant name	Fomento San Sebastián
E-mail	Ana_Aizpuru@donostia.org
Field	ICT network in the city

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	18

Initiative Title (Only public or public-private initiatives)

ICT infrastructure Manager

Location Map

Several nodes throughout the city

Initiative objectives

The goal of the project is to provide the city with a first class Wi-Fi and cable deployment so that municipal buildings and employees can be more efficient in their work. A second goal related to the project is the possibility of offering to citizens free Wi-Fi connection throughout the city and Wi-Fi connection to tourists coming to the city upon payment for the use of the service.

A broadband deployment was a need for the city and its services at municipal level. But also to foster competitiveness with different cable operators to provide better services at more economic solutions for citizens and municipal personnel.

Another aim of the project is to take advantage of new urbanizations, maintenance and/or urbanization works for the deployment of the optic fiber. Including the use of existing networks in which cable can be installed like in the sewerage system or in the traffic lights network. This also will give the opportunity to the city council to rent fiber to other organizations and companies, including ICT operators. Thus, the economic feasibility of the project will not rely on the municipal investment solely but also on the present and future use of the network by third bodies.

Initiative description: target areas, technologies

In July 2010 the Council of San Sebastián approved to entrust Fomento San Sebastián the implementation of the ICT management system for the city. In this context Fomento put into operation a service catalogue in terms of neutrality, transparency and no discrimination that would allow operator companies and any company to deploy their own network for self-use or commercial purposes. The project considered the deployment and management of ICT infrastructures in the city in two main areas, wireless infrastructures and deployment of optic fiber infrastructure and FTTH (Fiber to the home):
1.- Wireless infrastructures: Changes in the ICT Law framework by CMT (Telecommunication Market Commission) allows city councils to provide Wi-Fi services for free in any spot (inner or outer) and not only, as till now, in cultural centres. Taking advantage of this possibility the Council gave free access to every people that have the city card or that request it from the Wi-Fi network. In addition to that, it is also offered the possibility of the use of the network by tourists in the city upon the payment for this service.

From any Wi-Fi node in the city (both inner and outer) any student or teacher, from a university affiliated to the international project Eduroam, can get direct connection to university's network using its own passwords. It is foreseen the signature of an agreement with the University of the Basque Country-Ikerbasque for the use of this system to spread its possibilities.

The network has also been the based for the installation of security cameras in the city. They can be installed easily, in a permanent or temporal way, as well as any other elements that may require safe connections with an ICT network with high capacity and without extra costs in communications.

It has been also tested the possibility of giving access to all municipal employees to their municipal ICT resources (CIM) with the limits that the system may require. This would include access to their database systems, GIS, cartography, etc.
Over 1 million m^2 are covered by the network, including 43 hot spots outside and around 30 municipal buildings with inner coverage.
2.- Optic Fiber infrastructure: The deployment of a municipal optic fiber for municipal use, giving also the possibility of exploitation to other public entities and private communication operators, is a step forward to position the city among top cities in Europe in ICT.

The deployment is being done by incorporating the model in all new urbanizations (for instance in the case of Txomin-Enea). The urbanization process will consider the participation of the ICT management system as interlocutor with all operators coordinating their needs at infrastructure level. This also requires clarifying the ownership of previously developed infrastructures and their terms of use.

It is also consider taking advantage of other infrastructures of the city, such as the traffic light network, sewerage system, lighting network, etc. The ICT management system will also manage other municipal networks for the deployment of optic fiber (one tube with four channels of 72 cm (one for corporative use and the other three to provide services to third bodies).

In the case of civil works in the city, for urbanizations, maintenance or the deployment of private infrastructure in the city, up till three tubes of 110 cm will be installed with three microducts each. In this case one microduct of 40 cm will be used for municipal purposes and the other two microducts and the two other 110 cm tubes will be for the use of third bodies.

The network will give the opportunity to offer two type of services: a)Point to point: through the rent of conducts (with limited availability), rent of pairs of optic fiber and when there is not availability of other fibers the possibility of a 64 fiber cable on demand basis. The second service is b) Point to multipoint: In this case it will be considered the rent of cables for the totality of urban districts or defined urban spaces. The ICT management system will also be able to rent back fiber and channelling and pipes.

Starting year-Duration

The project started in 2010 with the deployment of the Wi-Fi and Wimax network. New hot spots are being studied so that the coverage in the city is as high as possible.

In the case of the optic fiber, as it can be seen in the map, it is also under development. But already over 10 nodes are operating and can provide service to municipal buildings and third parties.

Current situation

The new urbanization of Txomin-Enea (starting in 2015) will be very important to consolidate the deployment of the ICT management system. Specially in the case of the optic fiber given this is the only new urbanization in the city in the near future. The development of the network, acceptance of the use of this infrastructure by ICT operators and its level of use will give an approximation to the exploitation possibilities.

In the case of the Wi-Fi and Wimax networks the implementation will continue when and where feasible.

Key Performance Indicators

There are different indicators to be considered:

- Level of use: Number of connections by spot
- Level of use: Number of citizens (City card) and number of tourists (paid services)
- Level of use: Number of rented conducts
- Level of use: % of usage over the capacity of the fiber dedicated to municipal purposes.
- Annual income of rented conducts
- ROI
- VAN

The registry of users of the Wi-Fi network provides interesting information on how the hot spots are used. Information related to how long are connected, from which nodes, etc.

Key stakeholders

The deployment of the network is being done by Fomento San Sebastián with the help of other municipal departments. A key role is also played by private ICT operators that will behave as customers but also as partners in the implementation of the network.

The academic network of i2Basque plays also an important role as user of the network.

Lessons learnt

There are already over 20 km of fiber in the city linked from West to East and in the case of the Wi-Fi network 30 municipal buildings and 43 Hot spots offer connection possibilities to employees

and citizens distributed all over the city. Operators have cable network available that otherwise it would not have been possible and with competitive prices for operators avoiding undesired market distortions.

The Council has been able to connect over 15 sites with dark fiber allowing not only light but also ICT services with cost reduction.

Cost of the project

The cost of the investment of the Wi-Fi and Wimax networks has been of 200.000€ so far. New hot spots (inner and outer) are under consideration. But over 1 million m2 have already been covered.

In the case of the optic fiber the investment has already been of more than 300.000€ providing around 10 nodes. New investments are foreseen as in the case of Txomin. In these cases over 85% of the investment will be provided by ICT operators or other governmental bodies that will use the fiber. The cost for the Council will only be about 15% of the investment. It is expected that the payback will be in 2/3 years through the savings in connection expenses and after that the rent of fiber will become an important income source for Fomento and the Council itself.

Energy savings & other sustainable achievements

ICTs offer promising solutions for enhancing city's capacity to develop appropriate management and adaptation strategies. This is a transformative technology which maximizes the users' capacity to create and act sustainable. At the same time it must also be managed to avoid unintended consequences such as increased consumption and environmental damage from electronic waste.

One of the advantages of the network is that fiber is provided to operators at a lower cost and without the need of opening again a channelling for the cable. This permits to avoid civil works and annoyances to citizens and traffic.

The project is innovative given it does not affect competitiveness between different operators and provides a different model of private-public collaboration. The development of FTTH will also guarantee a network to offer and provide municipal services to citizens (health, social welfare, participation …) without having a contract with an operator of services. And it will be interactive because the cable guarantees the possibility of multidirection communication channels.

➢ICT 2- Green AddICT

Initial Date		**End of submission date**	25/10/2013

Participant name	Bristol City Council
E-mail	Lorraine.hudson@bristol.gov.uk

Field

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	19

Initiative Title (Only public or public-private initiatives)

Green AddICT

Location Map

Covers City of Bristol

Initiative objectives

Project Objectives:

- To develop a methodology to calculate the ICT carbon footprint of the City of Bristol which can be shared with other local authorities
- To establish Bristol's ICT carbon footprint baseline and a method to monitor it
- To promote action on Green ICT which will help Bristol to meet its citywide carbon reduction targets
- To establish an independent Green ICT solutions database which is hosted online and can

be used by organisations to create their own Green ICT action plans

- To create a Bristol Green ICT champions group who will act as pioneers within Bristol sharing best practice and working together
- To work with Bristol's voluntary and community sector to build capacity through Green ICT initiatives such as supplying them with free or low cost recycled ICT equipment
- To contribute to Bristol's Economic Development Strategy aim to shift jobs and business to low carbon activities

Initiative description: target areas, technologies

Green Addict promotes the uptake of Green ICT within Bristol organisations and shares best practice with a wider European audience. The project has developed a methodology to calculate the carbon footprint of ICT within a local authority area, which was funded by the Carbon Trust. A case study was undertaken for Bristol which established the city's first ICT carbon footprint baseline, which is the first of its kind within the UK.

The project also developed an interactive Green ICT Solutions Database and this is hosted online at www.greenaddict.eu along with the results of Bristol's ICT carbon footprint. Through the project a Bristol Green ICT champions group was established and case studies from the local authority, business and community/voluntary sectors are available on the website. A specfic Green ICT programme was also run with the community/voluntary sectors by VOSCUR , which resulted in a resource pack which is available at http://www.voscur.org/ict/greencomputing/resourcepack.

The initiative has raised awareness of Green ICT both within the Council and citywide, resulting in the City Council establishing a Green ICT lead and adopting a Green ICT Strategy for its own ICT services.

Starting year-Duration

2009 onwards

Current situation

Project website is live - www.greenaddict.eu - and hosts Green ICT database, case studies, ICT carbon footprint for Bristol and open source methodology etc. Bristol City Council has adopted and is implementing their own Green ICT strategy which is being implemented.

Key Performance Indicators

- Bristol ICT Carbon Footprint Methodology
- Bristol Carbon ICT Carbon Footprint
- Green ICT Solutions Database
- Green ICT Champions Group
- Green AddICT website
- Bristol Green ICT events
- Voluntary and community sector Green ICT programme & resource pack

Key stakeholders

Bristol City Council
VOSCUR
The Bristol Partnership
NHS Bristol
The University of the West of England
The University of Bristol
Lyons Davidson
Bristol Wireless
Ethical Property Company
Trinity Centre
CNR
Camco
CSV
First Great Western
SEA
Watershed
IP Performance
Audit Commission
Eurocities
DC10 plus
Carbon Trust

Lessons learnt

Green AddICT provides a framework within which the worlds of ICT, environment and energy are linked and can work in partnership. Creating a stakeholder base of organisations from a variety of sectors, which are committed to joint action to reduce the carbon footprint of their ICT usage. It demonstrates practical methods of reducing energy costs and increasing the efficiency of ICT use within organisations and assists them in creating their own Green ICT action plans.

The outputs have been shared with the FP7 NiCE project which links to the Green Digital Charter, which Bristol is a signatory of.

Cost of the project

£50,000/60.000€, with funding from DC10, Carbon Trust and Bristol City Council

Energy savings & other sustainable achievements

Energy and carbon savings are being measured through individual initiatives in the partner organisations. The results of the ICT Carbon Footprint for Bristol showed that ICT has the potential to lead to increased carbon and energy use in the city due to its growing use. ICT was 7% of business CO_2 emissions for Bristol in 2006 or 3% of the city's total CO_2 emissions (e.g. housing, business and transport).

➢ICT 3- 3e Houses Project

Initial Date		**End of submission date**	25/10/2013

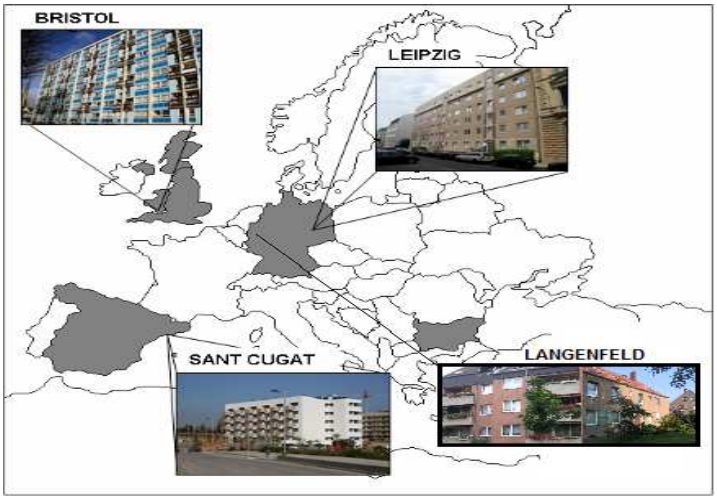
Participant name	Bristol City Council
E-mail	Milagros Rey Porto: mreyp@gasnatural.com
Field	

☐ ICT´s ☐Mobility ☐Energy efficiency

Initiative number	20

Initiative Title (Only public or public-private initiatives)
3e Houses Project

Location Map
The 3e Houses project took place in two pilot areas in San Cugat del Vallès, Spain and Leipzig Germany. Two further replicator projects were subsequently conducted in Bristol UK and Langenfeld Germany.



Initiative objectives

Overall objective taken from the project website:

The 3eHouses project aimed to support customers to reduce energy use in the home through increasing their understanding/ interaction with ICTs and smart metering systems. The role and behaviour of the customer in relation to the technology is key to understanding how households can reduce their energy consumption, enhance the environment and reduce CO2 emissions.

Particular outcomes for the project are to evaluate whether ICT's can affect behavioural and attitudinal change in those not previously aware of issues relating to energy use in the home, and help customers reduce energy consumption by 20%. The project seeks to assess the efficacy of ICT's in empowering customers to reduce energy use compared with those actions under the control of other stakeholders in controlling and reducing energy consumption.

Website - http://www.3ehouses.eu/

Initiative description: target areas, technologies

The 3e-HOUSES project concept was based on the design, implementation and dissemination of 4 demonstration pilots, integrating ICT technologies such as innovative control and monitoring systems, as well as Renewable Energies (RES) within social housing. This integration is focused on providing real time monitoring and control of energy consumption by providing information of how and where users consume energy.

The expected improvement in energy use was assumed to come from the following 4 aspects of the project:

Energy consumption information for the operator. The continuous monitoring of the energy use has been the way to allow control systems to optimise energy performance.

The use of embedded power production based on clean locally distributed and renewable resources without causing local instabilities in the electricity infrastructure.

Energy feedback to the tenant and the stimulation of behavioural changes on the users of the energy in social housing.

Demand response strategies for peak shaving and load shedding achieved by the integration of storage (EV) and conservation plans.

In line with this concept, the main objective of this project was to improve sustainability in European social housing, via ICT-based centralized monitoring and management of energy consumption and production, and to provide decision makers with the necessary tools to be able to plan energy saving and peak reduction measures.

Other specific objectives of the 3e-HOUSES project have been:

Definition of methodologies: To define the methodologies for measurement of energy consumption, for design the market campaigns to engage the tenants, and for evaluating the impact.

Pilots design: To make the design and implementation of specific ICT systems defining the basics principles of future integration, and methodologies to measure the expected impacts.

Pilots monitoring: To centralize the energy consumption and production monitoring, control and management in order to analyse the energy efficiency of the social housing. This objective has also allowed awareness-raising amongst users regarding the energy efficiency of the buildings they are using.

Pilot implementation: To use the information collected during monitoring, to implement corrective/optimization measures and improve the energy efficiency of the buildings. This has been achieved thanks to the possibilities given by the innovative systems being validated in the pilot that have led to a centralized control of the systems consuming or producing energy.

Pilot validation: To show evidence and demonstrate the cost recovery based on the achieved energy savings and energy efficiency improvement.

Replication of two pilots: To replicate the validated pilot experiences in other European countries in order to prove the replicability of the initiatives.

Results and impact analysis: To make an overall assessment of the project results by putting together the results obtained from each of the pilots, in order to extract conclusions, best practice and enhancement of the pilots.

Dissemination and promotion: To broadly disseminate the experience in order to raise public awareness and facilitate replication of the project.

Starting year-Duration

The project started in January 2010, and ran for 40 months in total.

Current situation

The 3e Houses project is now complete.

Key Performance Indicators

The 3-Houses consortium entailed:

- Administration: PROMUSA, Bristol City Council.
- ICT and energy systems provider: INDRA, ENNOVATIS, IP-P.
- Service provider: Gas Natural Fenosa, ENNOVATIS.
- Non-Profit organisations: Bulgarian Housing Association and KWMC.

Key stakeholders

Project coordinators have identified the following main learning points:

- Due to the nature of our project which required the committed involvement of participants who were not initially enlisted as part of the project team, we found it was necessary to provide appropriate incentives. We also found that it is essential to monitor the extent to which these incentives meet the expectations of these participants.
- In the 3eHouses project, social housing tenants were the target participants, hence the incentives provided were things they would be eager to acquire such as tablets, free wi-fi, etc. Another factor which impacted upon the success of the engagement campaign of the target participants, was to carefully select a small geographical target area for pilot replication, as it is easier to concentrate the engagement campaigning in a single neighborhood
- It it is also important to select the adequate target audience/participants in order to mitigate any technical barriers. In the 3eHouses project, a significant number of participants had no expertise or skills in the use of information technologies, or on

technical aspects of the measurement devices and they required regular support and supervision especially in the initial stages of the piloting.

- The project results depend heavily on the interaction and feedback of participants. Communication is key. To ensure success, simple and easy to understand messages must be used.
- In order to gather objective and accurate energy savings data, a standard guideline measurement is required, as well as the availability of reliable baseline data. Whenever possible, the availability of this data must be taken into account prior to chosing the target sample.
- Prior to making a decision on which measurement and impact methodologies to develop, due consideration must be given to what parameters and definitions need to be considered. Our consortium dedicated great efforts to this task, and shared the methodology with other projects in the same thematic area. We also developed the energy savings methodology even further to use as a basis for a Common European methodology (eeMeasure).

Pilots design and execution

The German and the Spanish pilot were implemented at the same time with different technologies, but with generally the same intention to: provide tenants with information about their energy consumption and support them to decrease consumption. The following points summarize the experiences of both pilots:

- The Spanish and the German pilot have shown that the use of ICT in households is a very useful tool.
- The implementation and running of a pilot involves a big challenge and requires a well planned process for the implementation.
- The German pilot did not achieve the 20% goal due to the already low energy consumption of participants, attributable to the economic situation of tenants in East Germany.
- Spanish pilot acheived the 20% goal.
- Tenants are not used to technology or energy saving topics and need to be well informed and supported throughout the project.
- The most effective saving technique was the optimization of the central heating system in one pilot building.
- Individual measures in people's homes are difficult to maintain and to monitor
- General commitment to participate in EE projects was low. Therfore incentives were necessary to get tenants involved.
- If tenants are provided with technology to save energy but also feel that they are fully involved in the project, it has a positive effect on their energy savings.
- Different generations of tenants require different contact options. Younger people maybe easily accessed via email or mobile phone, whereas elderly people prefer a personal contact and like to be visited at home.

Replicators desing and execution

The UK replication began considerably in advance of the German replication due to the delays caused by the failed Bulgarian replication. Both replications did manage to operate in full and had some common experiences;

- Recruitment and engagement can be hard and needs proper planning and plenty of time.
- Accurate, extensive baselines are important in calculating savings but proved difficult =due to billing issues (estimates/ pre-payment/ different periods) or the restricted length of measured baseline periods.
- Equipment needs to be robust and reliable to minimize inconvenience to participants, reduce support costs and to protect the reputation of the project.
- People's homes can be technology hostile environments- equipment can be regularly damaged, moved or disconnected deliberately or inadvertently.
- Tenants used the interface more often when provided with a mobile Tablet PC to do so.
- Stand-alone rather than centralized management systems have considerable overheads in deployment, management and support.
- ICT needs to be explained to the end users.
- The better the relationship with tenants, the better the results.

Lessons learnt

The 3e-HOUSES project was a CIP ICT PSP funded project. The total amount awarded way approx. £3/3,6€ million.

Energy savings & other sustainable achievements

The savings achieve in **both PILOTS** are shown in the following table:

Whole project (6 buildings + dwellings) in Spain and in Germany	Total adjusted Baseline	Total Consumption	Total savings	Total savings [%]
Heating Consumption [kWh]	1.423.027,67	1.312.398,93	110.628,73	7,8%
Domestic Hot Water Consumption [kWh]	137.313,58	117.717,14	19.596,44	14,27%
Electricity Consumption [kWh]	312.095,24	244.746,77	67.624,02	21,67%
Total energy consumption [kWh]	**1.872.436,49**	**1.674.862,84**	**197.849,19**	**10,57%**
Cold water consumption [l]	6.012.027,48	5.610.088,36	401.939,12	6,69%

Table 1. Summary of energy and water savings in the Spanish and German pilot

Separating the results for pilots, in **SPANISH PILOT** we obtained:

Whole project (3 buildings + dwellings)	Total adjusted Baseline [kWh]	Total Consumption [kWh]	Total savings [kWh]	Total savings [%]
Heating Consumption [kWh]	646.025,82	525.258,58	120.767,23	18,7%
Domestic Hot Water Consumption [kWh]	112.755,86	89.902,23	22.853,63	20,27%
Electricity Consumption [kWh]	234.762,82	165.031,19	70.181,63	29,89%
Total energy consumption [kWh]	**993.544,50**	**780.192,01**	**213.802,49**	**21,52%**
Cold water consumption [l]	2.075.627,48	1.732.568,36	343.059,12	16,53%

Table 2. Summary of energy and water savings in the Spanish pilot

Savings for dwellings:

DWELLINGS	ENERGY SAVINGS [%]
DHW [kWh]	20,23%
Heating [kWh]	10,06%
Electricity [kWh]	31,52%
TOTAL [kWh]	**20,02%**
Cold water [l]	16,22%

Table 3. Summary of savings in all 60 dwellings of the Spanish pilot

for the buildings:

BUILDINGS (BC + LC + SB)	ENERGY SAVINGS [%]
Electricity and gas [kWh]	22,28%

Table 4. Summary of savings in all three Spanish pilot buildings

Although some tenants did not achieve savings during the project, **total energy savings in dwellings (20%) and buildings (22%) were achieved in all types of energy consumption. The total energy savings achieved in Spanish pilot were 21,52%, more than the initially estimated 20%.** The ecopoints system (demand response strategies) had positive results on tenant's behavior. **In GERMAN PILOT** we obtained:

Whole project (3 buildings + dwellings) in Germany	Total adjusted Baseline	Total Consumption	Total savings	Total savings [%]
Heating Consumption [kWh]	777.001,85	787.140,35	-10.138,50	-1,3%
Domestic Hot Water Consumption [kWh]	24.557,72	27.814,91	-3.257,19	-13,26%
Electricity Consumption [kWh]	77.332,42	79.890,03	-2.557,61	-3,31%
Total energy consumption [kWh]	**878.891,99**	**894.845,29**	**-15.953,30**	**-1,82%**
Cold water consumption [l]	3.936.400,00	5.610.088,36	401.939,12	10,21%

Table 5. Results obtained for the whole German pilot

For the dwellings:

DWELLINGS	ENERGY SAVINGS [%]
Heating [kWh]	0,83%
DHW [kWh]	-13,26%
Electricity [kWh]	-3,31%
TOTAL [kWh]	**-1,83%**
Cold water [m^3]	2,96%

Table 6. Summary of energy savings in all 29 dwellings of the German pilot

For the buildings:

BUILDINGS LEIPZIG+BITTERFELD	ENERGY SAVINGS [%]
Heating [kWh]	-1,30%
Cold water [m^3]	1,50%

Table 7. summary of savings in the German pilot buildings

West **savings were higher, where 20% were achieved in gas consumption, while in Dove Street, nosavings were acheived.**

dwellings - Langenfeld	Total adjusted Baseline	Total Consumption	Total savings	Total savings [%]
Heating [kWh]	94.692,50	81.824,79	12.867,71	13,59
Electricity [kWh]	42.511,77	39.815,60	2.696,16	6,34
cold water [m³]	996,00	923,60	72,40	7,27
Total energy [kWh]	137.204,27	121.640,40	15.563,88	11,34
Total CO2 [kg]	28.894,44	26.996,16	1.898,28	6,57

Figure 2: Percentage energy savings German Replicator

Similarly, completely different results were achieved in both the German pilot and German replicator. Whilst in the pilot it was not possible to achieve savings, in the replicator, **savings of 10% were acheived.**

The total results achieve for pilots and replicators were:

TYPE OF CONSUMPTION		TOTAL CONSUMP. (kWh)	BASELINE (kWh)	SAVINGS (kWh)	% SAVINGS
ELECTRICITY	SPANISH	165031	234763	69732	29,70%
	GERMAN 1	79890	77332	-2558	-3,31%
	UK	240200	251200	11000	4,38%
	GERMAN 2	39.816	42.512	2.696	6,34%
HEATING	SPANISH	525259	646026	120767	18,69%
	GERMAN 1	787140	777002	-10138	-1,30%
	UK*	107000	147000	40000	27,21%
	GERMAN 2	81.825	94.693	12.868	13,59%
DHW	SPANISH	89902	112756	22854	20,27%
	GERMAN 1	27815	24558	-3257	-13,26%
	UK	-	-	-	-

	GERMAN 2	-	-	-	-
COLD WATER (l)	SPANISH	1732568	2075627	343059	16,53%
	GERMAN 1	5610089	3936400	-1673689	-42,52%
	UK	-	-	-	-
	GERMAN 2	923,60	996,00	72,39692	7,27%
TOTAL ENERGY SAVINGS		**2143877**	**2407841**	**263964**	**12,31%**
* in UK we consider only the gas consumption					

Figure 3: Total energy results

The total energy saving across the whole project (pilots and replication) was 12.31%. This result is consistent with several other projects developed so far that indicate that it is very difficult to reach the 20% goal.

A full list of project documentation can be found at:

http://www.3ehouses.eu/energy-efficiency/documentation?page=2

5.4 Multiple – Sectors

➢MS 1- European Local Energy Assistance（ELENA)

Initial Date		**End of submission date**	25/10/2013

Participant name	Bristol City Council
E-mail	elena@bristol.gov.uk
Field	

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	21

Initiative Title (Only public or public-private initiatives)

European Local Energy Assistance (ELENA) programme

Location Map

Covers the City of Bristol

Initiative objectives

The key objectives of the programme are to:

- Reduce the cost and level of energy consumption for the council and other public sector organisations
- Improve energy security and reduce fuel poverty
- Maximise job creation and investment in Bristol and the wider region
- Maximise profits that can be reinvested into new energy efficiency and renewable energy projects across the city and West of England region

• Reduce Carbon (CO2) emissions

Initiative description: target areas, technologies

The council has recently been awarded a £2.5 million technical assistance grant under the European Investment Bank's European Local Energy Assistance (ELENA) programme to develop investment programmes in energy efficiency and renewable energy projects in Bristol and the wider sub-region – with an estimated potential investment of up to £140 million.

There are four strands under which investments will be made as part of the ELENA programme:

1. District heating – the council has developed a plan for investment into district heating at the city level, identifying an initial 10 sites where this might be feasible. The ELENA programme will enable detailed feasibility studies of at least three of these sites with a view to installation of the first within the next 18 months.
2. Public buildings retrofit – aims to deliver low carbon refurbishment measures across public sector organisations including the council's own building stock.
3. Domestic retrofitting – has two strands, energy efficiency and renewable energy measures across social and private housing in the city. The Strategic Energy Unit has already started delivery of its domestic energy saving strand with the Bristol Home Energy Upgrade Scheme, which also trialled the Government's flagship energy efficiency programme – the Green Deal.
4. External cladding and heating upgrade project aims to deliver external wall insulation to high and low-rise council-owned flats across the city, and upgrade gas boilers in council-owned properties.

Starting year-Duration

September 2012

Current situation

- **Scoping: March – July 2010**
  1. Political support in place to consider and adopt innovative energy/carbon solutions – in place
  2. Senior level champion identified to manage the whole process and carry influence across the stakeholder groups – in place
  3. Council-wide project group in place to manage the scoping process – in place
  4. External stakeholders identified to bring in private sector expertise – in place
  5. Visit to Brussels to discuss ELENA application with EIB/European Commission officials

or alternatively fact finding mission to Bristol

6. Application to ELENA submitted

- **Project development – Feasibility study: July – March 2011**
- Evaluation of the different characteristics of ESCO models and the variety of finance and contracting models used across the UK and Europe
- Stakeholder workshop involving a wide range of public and private partners to identify the needs of an energy company
- Potential study visit to learn more about different ESCO models in the UK and or Europe
- Evaluation and financial appraisals of the pilot projects and classification of the opportunities that exist in terms of size, usage, energy demand, services required, new build
    - Identification of barriers to uptake and implementation of ESCOs and drivers and enablers to resolve this
    - Financial modelling ESCO, business plan in place
    - Soft market testing
    - Procurement and legislative frameworks and standard contracts in place (Clinton Climate Change Initiative)
    - Detailed work plans developed for each pilot project

- **Financing: July – March 2011**

    - Work with partners to produce a mutually acceptable economic and operating finance model for pilot projects
    - Finance/loan schemes identified to support the work of the energy company
    - High level Memorandum of Understanding in place and signed by all parties

- **Implementation, installation, operation and maintenance of the pilot projects: March 2011 – March 2014**
    - As per project plans
    - Pilot projects and broader markets to be furthered though the establishment and management of working groups, networking and “meet the buyer” type events
    - Communication and marketing plan to be implemented, community groups to be involved
    - Defining a wider role for the ESCO

Key Performance Indicators

City-wide Energy Service Company

It is planned to establish a single citywide energy services company to provide the strategic direction for the delivery of individual projects and guarantee a holistic and consistent delivery of the Council's vision for energy supply and networks in the longer term. Bristol will draw on experience from other UK and European cities to enable a detailed understanding of their approaches and operation but develop its own bespoke solutions at the local level.

The planned ESCO will have the following objectives:

- To promote and increase energy efficiency, energy conservation and environmental objectives by providing energy and/or environmental services
- To develop and implement projects for the production and supply of energy
- To produce and supply energy (and related by-products) in all its forms
- To provide financial, managerial and administrative advice, services and assistance

It is likely that one or more of the following services will be provided:

- Energy analysis and audits,
- Energy management,
- Project design and implementation,
- Maintenance and operation,
- Monitoring and evaluation of savings,
- Property/facility management,
- Energy and/or equipment supply,
- Provision of service

The planned ESCO will act as an umbrella organisation and co-ordinate, implement and finance (or arrange financing for) several energy efficiency and renewable energy projects in the city. Potential pilot project options are outlined below and specific efforts will be made to involve the ESCO in the development of these projects from a very early stage on to provide effective energy services.

The following benefits of establishing an ESCO have been identified by Bristol City Council:

- Reduced operating and capital costs as projects can be bundled
- Protection from fluctuation in energy costs
- Cheaper energy though economies of scale or partnerships
- Capital to invest in more energy efficient technologies

- Alternative perspectives on risks and investment criteria
- Holistic approach to regeneration in particular in South Bristol
- Trading opportunities for the Council, either to support borrowing for invest to save projects or as revenue to support the general fund budget.

There is a wide variety of business models being used for the delivery of energy projects by local authorities in the UK due to the fact that there is not yet a well-developed market for the provision of energy services to public authorities. This also results in different attitudes to risk and the degree to which the private sector is involved. A particular focus will therefore be placed on structuring the pilot projects, considering who should participate in the ESCO and what kind of form it should take. This depends; of course, to a large extend on how the schemes are to be financed. Financing is likely to be a combination of available grant assistance, financial commitment by the Council, and financial commitment by the private sector organisation involved in the delivery of the project in combination with borrowing funds. Detailed financial modeling and different scenarios in terms of partnerships with the private sector will need to be explored through ELENA.

In addition to this, various contracting models such as Energy Performance Contracts (EPCs) and Energy Supply Contracts (ESCs) exist but critically they normally reward improvements in energy efficiency and use the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project, including the costs of the investment. Again, it is crucial that these different contracting models and what they can deliver are explored in particular with regards to the recent introduction of feed-in tarriffs in the UK.

As these processes are highly complex, there is also a need for Bristol City Council to develop general capacity in this field in particular with regards to bundling projects and using the synergies in order for these projects to become economically and financially viable.

According to detailed modelling of energy use and carbon dioxide emissions, Bristol has a heat demand of 4,024,000 MWh, which is currently mainly met by individual property natural gas boilers. The Council wishes to develop district heating to improve the efficiency of heat production and to incorporate renewable energy supplies – in particular biomass. BCC's statutory land use plan has identified a Heat Priority Area where all new development will be expected to incorporate infrastructure for district heating, and will be expected to connect to existing systems where available thereby maximising private investment in district heating. This heat priority area covers 70% of the city's heat load in 45% of the city area. An investment programme with three components is planned to complement the regulatory regime:

Inspiration. Bristol City Council is currently delivering a biomass boiler programme investing £4m in boilers in public buildings and this will bring public biomass installations to 11. This is being promoted widely in the city to help citizens and community groups think about installing their own biomass boilers to save CO2 and energy costs.

- **Demonstration**. The Council is proposing public sector led micro-networks based around key buildings and developments. Some of these have potential to use local biomass. There are three sites and the estimated cost of implementation is £13m/16m€.
- **Delivery.** Bristol City Council is planning to use its strategic regeneration initiatives in South Bristol and/or the city centre, involving 20,000 new homes and >100, 000m² commercial space to develop a biomass district heating network to serve the densest parts of this new development (estimated at 5,000 homes). The estimated cost of implementation is £ 50m/60m€.

Photovoltaic programme

Bristol is located in the South West of England and receives good levels of solar radiation on the ground. Roof space on public, commercial and residential buildings is a key resource, which is currently rather unused in the city. The UK Government introduced feed-in tariffs for PV on the 1st April 2010, which is similar to the German system to enhance the uptake of renewable energy sources. As a result, the Council will be able to receive preferential tariffs for solar generated electricity on its own buildings depending on the nature and size of the installation, which makes them financially and economically viable. There is also the potential to encourage citizens to install solar panels on their homes to benefit from the new feed-in tariffs. The programme has three components:

- **Inspiration.** Installation of 100 PV systems on suitable council buildings and housing stock funded from Council resources and communicated widely in the city. This is likely to involve in excess of £1m and is being planned for deployment in 2010/11.
- **Demonstration**. Installation of 5,000 m2 of PV on public buildings and 200 domestic buildings. Estimated cost of implementation £5m/6m€.
- **Delivery.** Installation of 10,000 domestic PV systems on municipal/social housing stock possibly in partnership with the Energy Savings Trust. Estimated cost of implementation £110m/132m€.

Retrofit programme

Bristol's Climate Change and Energy Security Framework 2010 plans a 30% reduction in energy use in the city in the next 10 years through investment in energy efficiency in buildings and equipment. This will require significant investment from public and private sector organisations and individuals. The proposed programme has four components:

- **Completion of "simple measures" in all homes**. Bristol City Council's successful programme of domestic energy efficiency has delivered 23 % improvement in home energy efficiency since 1996. This has focused on simple measures such as loft insulation and cavity wall insulation. There remain some 1000 properties, which would benefit from simple measures and it is proposed to provide a grant/loan fund for all relevant households to undertake this. The estimated cost of the project is £155m/186m€.
- **Demonstration project in the Public Sector.** It is proposed to provide visible examples of the benefits of retrofitting buildings, lighting and energy systems. It is therefore planned to combine street lighting, primary school refurbishment and public building rationalisation

and refurbishment projects. The estimated cost of the programme is £24m/28,8m€.

- **Domestic advanced measures project – demonstration phase**. The Council will work with homeowners to invest in their homes and undertake advanced measures such as solid wall insulation and the installation of micro renewable energy. Two major key barriers are the availability of finance and supply chain weaknesses. The Council's demonstration project will provide a loan fund for 500 homes and undertake supply chain development to enable local construction businesses to train and develop the products needed for this step change in retrofitting. The estimated cost of this is capital of £5m/6m€.
- **Domestic advanced measures project – delivery phase.** The Council is aiming to extend the programme into delivery and develop a revolving loan fund, which will provide sufficient finance for approximately 10,000 homes. The estimated cost of this is capital of £100m/120m€.

Wind power programme

Due to its proximity to the sea, the South West of England has a substantial wind resource but one of the largest barriers to its use is public acceptance. Significant efforts need to be made to raise awareness and increase public acceptability of wind power in Bristol. This will then enhance opportunities for large-scale wind development in the Bristol and South West Region.

Bristol's westward facing location provides a good wind resource but much of the administration's area is urban and the key sites for large-scale installations are being developed. The Council's wind power programme will utilise prominent locations to provide demonstrations of wind energy. The programme has two phases:

- **Demonstration** – The City Council is already investing in two 3MW turbines on brownfield land close to the motorway network providing a very positive image for wind power. Planning permission has been secured and the investment model will focus on delivering financial benefits for the community. The planned investment is £9m/10,8m€.
- **Inspiration** – Education beacon project installing 100KW turbines at six Secondary School sites at prominent locations on the gateways into Bristol. These will provide an educational resource for the schools and help promoting the concept to the wider general public. Estimated cost of implementation £2m/2,4m€.

Key stakeholders

Bristol City Council as coordinators of the scheme.

Lessons learnt

Ongoing

Cost of the project
Upfront finance arrangement of £2.5m/3m€, to secure further inward investment of £250m/300m€

Energy savings & other sustainable achievements
See individual pilot project detail above

➢MS 2- Climate Change & Energy Security Framework 2012-15

Initial Date		**End of submission date**	25/10/2013

Participant name	Bristol City Council
E-mail	steve.marriott@bristol.gov.uk
Field	

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	22

Initiative Title (Only public or public-private initiatives)

Climate Change & Energy Security Framework 2012-15

Location Map

Covers the City of Bristol.

Initiative objectives

The Bristol Climate Change and Energy Framework 2012-15 was adopted in March 2012 sets out how the City Council will work with partners to reduce the city's CO2 emissions by 40% by 2020 from a 2005 baseline, and how the city will adapt to climate change. The framework sets out 19 broad strategic activities and these there are 65 specific actions covering emissions from buildings, transport, business and city-wide activity.

The framework forms Bristol's SEAP under the Covenant of Mayors and is the 3rd iteration of a climate change plan for Bristol. The first was the Climate Change and Sustainable Strategy

2004/06 followed by the Green Capital Action Plan. In February 2010 Cabinet adopted the Climate Change and Energy Security Framework which set out actions for 2010/11 and this has been updated in the 2012-15 Framework.

Initiative description: target areas, technologies

The Framework sets out 65 actions in the following 19 strategic areas. Details of the individual actions are at:
http://www.bristol.gov.uk/sites/default/files/documents/environment/climate_change/CC%26ESF%202012-15%20FINAL.pdf

Buildings

1. Deliver energy efficiency & integrated renewable energy programmes for the city's buildings

2. Reduce emissions from the council's building & operations by 40% by 2020 including schools from 2005

Sustainable Energy Supply

3. Plan & implement sustainable energy for Bristol, such as district heating, wind, solar & biomass installations

4. Integrate sustainability & carbon & energy targets into all council projects, programmes & strategies.

Planning

5. Create & implement a low carbon & energy resilient planning policy framework & development management process

Green Digital Economy

6. Use our strategic influence & partnerships to help create a low carbon economy & promote national & local business resource

7. Work with public sector organisations to reduce their direct & supply chain carbon emissions & to capitalise on opportunities to develop a low carbon economy

8. Develop Bristol as a Smart City by strengthening digital infrastructure & using smart technologies to deliver carbon savings & economic benefits

9. Promote & develop Bristol's environmental technology, innovation & services sector

Transport & Travel

10. Implement citywide travel & transport programmes, plan land use & deliver integrated, sustainable transport systems to reduce transport energy use & carbon emissions in Bristol

11. Develop & deliver our corporate travel & transport policies

Adaptation & Resilience

12. Review the vulnerability of all council services to peak oil, energy security & climate change &

improve their resilience

13. Work with organisations in Bristol on climate change & peak oil response

14. Work with partners to review the vulnerabilities of Bristol's food systems by increasing their resilience & enhancing their adaptability

Communities & Culture

15. Support action by individuals, communities, Neighbour-

hood Partnerships & community, voluntary & social enterprises on climate change & peak oil response

16. Work with schools to improve their sustainability through physical infrastructure, management systems & curriculum development

17. Work with our cultural partners to improve their carbon performance & raise awareness of climate change issues

Waste & Recycling

18. Increase resource efficiency by helping residents reduce, recycle & compost their waste, developing waste treatment innovations & improving sustainability of BCC trade & street waste collection & disposal services

19. Increase efficiency of the Council's internal waste management, including procured goods & services

Starting year-Duration
2012-2015

Current situation
The Framework is being implemented and monitored.

Key Performance Indicators
Progress against our carbon dioxide (CO2) target is measured using energy and transport data provided annually by the UK Government for each local authority area. It is broken into CO_2 emissions for homes, industry and commerce and transport.

Key stakeholders

- Bristol City Council Departments and schools
- Public sector partners e.g. University of Bristol, University of West of England, NHS Bristol, Bristol Partnership, Bristol Green Capital, West of England Partnership
- Businesses in Bristol e.g. Bristol Green Capital pledgers, waste contractor, Centre for Sustainable Energy, Arup, Toshiba, First Bus, Western Power Distribution etc.
- Community organisations e.g. VOSCUR, community energy organisations, Knowle West Media Centre
- Residents of Bristol

Lessons learnt

Bristol City Council has been working on climate change and energy issues for over 10 years. With lots of successful projects completed already, Bristol is moving forward to a new phase of action. All the positive changes we make today will help to create a better future for the city and its people. Every area of the city is set to benefit, with plans for better street lighting, warmer homes, greener buildings and improved waste collection services.

We have invested over £20/24€ million in delivering projects as including insulating homes, installing solar electricity systems in over 30 schools, supporting 40 'green' community projects and the Catalyst Community Energy Fund, adopting new low carbon planning policy and transport plans, and improving the energy efficiency of Council buildings. Building on this success we updated the Framework working with city partners. The Climate Change and Energy Security Framework 2012-15 was adopted in March 2012 and includes over 60 actions covering emissions from buildings, transport, business and city-wide activity. The planned capital investment contained in the Framework is approximately £450 million, mainly for transport and energy infrastructure.

On 28 September 2013 at the ICLEI (Local Governments for sustainability) World Mayor's Summit on Climate Change, Bristol's Mayor George Ferguson signed the Nantes Declaration of Mayors and sub-national Leaders on Climate Change, which calls for a new framework for cities to access global funding in order to expand their vital climate actions, and commits local leaders to closer collaboration with other levels of government, particularly at the national level. The Mayor will be working alongside other cities, partner organisations, the government and council officers to help make these ambitions a reality for Bristol as it approaches its year as European Green Capital in 2015.

Cost of the project

The planned capital investment contained in the Framework 2012-2015 is approximately £450/540€ million, mainly for transport and energy infrastructure. Prior to this we have invested over £20/24€ million in delivering projects as including insulating homes, installing solar electricity systems in over 30 schools, supporting 40 'green' community projects and the Catalyst Community Energy Fund, adopting new low carbon planning policy and transport plans, and improving the energy efficiency of Council buildings.

Energy savings & other sustainable achievements

The most recent CO_2 data is for 2009 and shows Bristol's total CO2 emissions have reduced by 15% between 2005. During this time there has been a 20% reduction in per capita emissions, as Bristol's population has grown by 6%. Bristol also has a target to reduce energy use by 30% by 2020 from a 2005 baseline. Overall energy use has reduced in the city by 14% between 2005 and 2009.

➢MS 3- Smart City Bristol Programme

Initial Date		**End of submission date**	25/10/2013

Participant name	Bristol City Council
E-mail	Lorraine.Hudson@bristol.gov.uk

Field

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	23

Initiative Title (Only public or public-private initiatives)

Smart City Bristol Programme

Location Map

Projects within the programme relate to City of Bristol, but also collaborations with other European and UK Cities.

Initiative objectives

Smart City Bristol is a collaborative programme between the public sector, business and community which builds upon the city's digital infrastructure. The aim is to use smart technologies to meet our ambitious target to reduce CO2 emissions by 40% by 2020 from a 2005 baseline, and our wider social and economic objectives.

It was launched in 2011 and builds upon the Smart City Bristol Report commissioned by Bristol City Council and funded by the UK Department of Energy and Climate Change. This study undertook:

a)An independent analysis of how smart city technologies can contribute to Bristol's carbon

reduction objectives;

b)Benchmarked Bristol against other world cities; and

c)Offered a set of objective recommendations that will contribute to further emissions reductions and provide citywide economic benefits.

Initiative description: target areas, technologies

The Smart City Programme currently has 3 key areas:

1. Smart Energy

3e-Houses: a European funded smart metering project that promoted energy saving by helping users to find out how much energy they consume e.g. real time monitoring and management of the energy consumption, integration of renewable energies and development of tools for designing and evaluating energy saving plans. 100 social homes in Bristol participated in the project.

So La Bristol: an innovative smart grid project funded through Ofgem's Low Carbon Network Fund and led by Western Power Distribution which is integrating Battery Storage with Demand Response, Direct Current Networks to connect PV panels and DC appliances together and Smart Tariffs. The technology is being implemented in 10 schools, 1 office and 30 homes all owned by Bristol City Council.

Smart Spaces: is a European project with the aim to substantially reduce peak and overall demand for energy and water across EU public buildings. It will develop a service comprising innovative ICT-based energy decision support, awareness and management service components. There are 11 pilots in 8 countries with almost 20,000 professionals and staff users and it is estimated to reach more than 6,000,000 visitors annually. Bristol is deploying this in over 500 public buildings.

STEEP: is a European funded project involving San Sebastián, Bristol and Florence. The objective is to contribute to the European aim of making the production and use of energy in cities more sustainable and efficient by the development of smart city plans which address the efficiency of energy flows across all the key sectors in the energy value chain using a systems thinking approach.

2. Smart Transport

ICT 4 EVEU – is a European funded project that aims to deploy an innovative set of ICT services for electric vehicles in pilots across Europe. It will integrate different management systems operating on the existing electric vehicle infrastructures in the cities so that related services can be deployed and make use of these interconnected infrastructures (e.g. charging points, control centres and vehicles). The pilot areas are Bristol, Pamplona, Vitoria, Ljubljana and Maribor.

Bristol Freight Consolidation Centre: running since 2004 this centre has helped to reduce congestion and associated emissions. It works by acting as a central delivery hub on the periphery of Bristol where deliveries are streamlined and the number of delivery vehicles travelling into Broadmead and Cabot Circus are reduced, whilst at the same time it provides an improved delivery service to retailers.

Bristol Traffic Control Centre: Bristol has had an urban traffic control centre since the 1980s but in 2008 this was upgraded and now uses more than 200 cameras to monitor vehicular movements throughout the city, ensuring highway safety and the continual flow of traffic throughout the city's busy road network.

3. Smart Data

Open data: B-open is the Council's current open data portal with the aim to promote transparency and increase public and neighbourhood engagement, making it easier to share information with citizens and businesses. In 2010 the Council working with the Watershed supported a Media Sandbox Competition with SMEs, which centred on the creation of ideas that explore rich experiences augmented by open data or mobile, wireless and sensory technologies. We are now developing a city open data platform which share data but also create a platform for companies and citizens to innovate on.

Whose Data?: explored new and innovative ways in which "live" data can be represented to benefit local people. The four artists (Julie Myers, Susanne Stahl, Paul Hurley and Richard Layzell) worked with the Knowle West Media Centre on the project utilising different local data sources.

Hello Lampost: by design and research studio PAN, was the recipient of Bristol's first ever Playable City Award. It invited you to tune in to the secret conversations of the city and communicate through lamp posts, bus stops, post boxes and other street furniture. Part game, part story, anyone was able to play by texting in a unique code found on the city's familiar street objects. The project received wide recognition in national and international press and led to 25,674 texts messages being sent. The Playable City is a new term, imagined as a counterpoint to 'A Smart City', where openness and permission to play is key, enabling residents and visitors to rewrite the city's narrative by being playful in public.

Starting year-Duration
2011 - ongoing

Current situation
The programme is being implemented as detailed in the initiative description box.

In addition we have a new project which started in 2013:

Future City Demonstrator

We are 1 of 4 UK Future City Demonstrators funded by the Technology Strategy Board in 2013. Through our demonstrator we are strengthening our partnership approach to smart cities and identifying the best business model and governance structure to take forward Smart City Bristol for the next 5-10 years. We are also further developing the city as a Living Laboratory, creating a city open data platform and sensor network, working with citizens and business to create digital products, apps and services. We are focusing on trialling and testing innovative solutions in areas including mobility on demand, personalisation in health and social care systems, city governance and future workplaces.

Key Performance Indicators

Smart City Indicators are being developed as part of the individual projects and we are also exploring the area through the Future City Demonstrator.

Key stakeholders

5. Public sector organisations – Bristol City Council, University of Bristol, University of the West of England, University of Bath, NHS Bristol, Bristol Green Capital, UK Government, Technology Strategy Board etc.
6. Business – Toshiba, IBM, HP, Arup, CSE, Clean Energy Prospector, Open Knowledge Foundation, Siemens etc
7. Community organisations – Knowle West Media Centre, VOSCUR etc.
8. Citizens of Bristol
9. Other UK and European cities
10. Eurocities
11. European Commission
12. UK Core Cities

Lessons learnt

In Bristol we recognise that it is the innovative integration of different technologies to tackle specific challenges and opportunities that make cities and communities 'smart' and that this

requires the commitment and close collaboration of city stakeholders. The involvement of people and communities is even more important; it's about how people work with the technology and it's important to involve them in the development of experiences, products and services that help the City to achieve its aims. We take a Living Lab approach to involving citizens in the co-design of Smart City Bristol.

Bristol has a strong public, private and people partnership approach to smart city work, with support from the city's universities, businesses including SMEs, public sector, community partners and citizens. This is currently operated on an informal level but we have commissioned some work to establish how we can move to a more strategic and sustainable business model for our smart city work which would include formalising our partnership and governance approach.

It is critical to take a partnership approach to deploying a smarter city in order to tackle city challenges and opportunities at the scale needed but also many areas are outside of local authority control. But it also brings added opportunities of aligning the strategic priorities of different city partners, the pooling of skills and knowledge, the ability to draw down different types of funding and joint opportunities for citizen engagement and communicating progress. However there are challenges, particularly those organisations are driven by different outcomes and it can be difficult to align those. There is also a need to explore and agree how to cover the financial and resource needs of managing such a partnership and local authorities need to be particularly careful of procurement regulations and also to be open to a range of new innovative opportunities rather than being tied into a small number of suppliers.

We believe having a distinctive strength is also what makes a Smart City and in Bristol our strength is the collaboration of our micro-electronic and environmental technology sectors with our creative/digital companies who are working with communities to make them smart, for example through Bristol's Living Lab in Knowle West.

Cost of the project

We have approximately £5/6€ million funding for smart city projects which includes £3/3,6€m from the UK Technology Strategy Board for the Future City Demonstrator.

Energy savings & other sustainable achievements

We are exploring the energy and carbon savings through the specific smart projects

➢MS 4- Bristol Citywide Sustainable Energy Study

Initial Date		**End of submission date**	25/10/2013

Participant name	Bristol City Council
E-mail	steve.marriot@bristol.gov.uk
Field	Sustainable energy production

☐ ICT´s ☐ Mobility ☐ Energy efficiency

Initiative number	24

Initiative Title (Only public or public-private initiatives)

Bristol Citywide Sustainable Energy Study

Location Map

Covers the entire city of Bristol.

Initiative objectives

The underlying aim of this study was to assist Bristol City Council in developing Local Development Framework (LDF)* policies which positively encourage reduced energy consumption and carbon emissions from buildings and greater sustainable energy generation. The study was produced by the Centre for Sustainable Energy and Adrian Smith, Independent Planning Consultant.

Planning for sustainable energy at national policy level imposes a number of requirements on local authorities to take increased action through the local planning system, and provide greater opportunities to make best use of local resources to maximise sustainable energy implementation.

*The Bristol Local Plan (previously called the Bristol Local Development Framework) comprises a set of local plan documents which contain a range of policies to guide future development decisions.

Initiative description: target areas, technologies

The underlying aim of this study was to assist Bristol City Council in developing Local Development Framework (LDF) policies which positively encourage reduced energy consumption and carbon emissions from buildings and greater sustainable energy generation. This evidence base therefore considered the development of local policies on renewable and low carbon energy generation in the LDF Core Strategy, taking into account anticipated national and Regional Spatial Strategy policies and targets on low carbon energy, sustainable construction, homes and jobs.

The scope of the study also included the identification of sites where there is potential for sustainable energy generation, both on and off-site in:

- new development
- integration of sustainable energy generation with existing neighbourhoods (e.g. where
- urban extensions are adjacent to existing development)
- retrofitting existing buildings

Starting year-Duration

Report was published in June 2009.

Current situation

The Bristol Local Plan is now adopted and is a set of planning documents which contains a range of policies to guide future development decisions.

Core Strategy - is part of the Local Plan which sets out the overall approach for planning development in Bristol.

1997 Adopted Local Plan - contains certain policies that are saved and still used in deciding planning applications.

Site Allocations and Development Management – will include policies about what sites can be built on and which should be protected from development.
Bristol Central Area Plan – will guide development in the city centre.
Joint Waste Core Strategy – guides decisions about where major waste facilities should be built.
Local Development Scheme – explains what planning policy documents make up the Bristol Local Plan. It also includes a timetable for preparing them.

The city council adopted many of the recommendations outlined in the report. For example the Core Strategy adopted in 2011 contains a policy on climate change (BSC 13) and Sustainable Energy (BSC14) http://www.bristol.gov.uk/sites/default/files/documents/planning_and_building_regulations/planning_policy/local_development_framework/Bristol%20Development%20Framework%20Core%20Strategy%20June%202011.pdf

It also helped to inform projects in development such the establishment of wind turbine at Avonmouth, the setting up of an ESCo and establishing a district 'heat map'.

Key Performance Indicators

Not applicable to this project but see lessons learnt section.

Key stakeholders

Bristol City Council
Centre for Sustainable Energy

Lessons learnt

The report made the following recommendations:

Overarching statement on climate change

To justify and contextualise the development specific policies, an overarching statement should be considered at the outset focused on climate change, CO2 reduction targets and renewable and low carbon energy targets. An overall greenhouse gas reduction target of 80% by 2050 is recommended, in line with the latest UK policy. Citywide targets for renewable and low carbon energy technologies and how they may relate to an appropriate trajectory of CO2 reduction towards the 2050 target should be the subject of further study and consultation. These should be

informed by the results of the renewable energy resource assessment presented in this report.

Site sustainable energy policies

A low carbon energy policy for new residential developments should be included, which sets increasing standards for CO2 reduction in stepped phases up to 2026. The two scenarios tested in this report will offer a range of CO2 savings and the Council's perception of 'undue burden' on developers of the additional cost of low carbon measures will largely dictate which scenarios to take forward. The evidence presented in this report suggests that for an additional 7% increase in development cost between the two Scenarios, there would be a further 28% reduction in emissions from new development, and for this reason the authors recommend that Scenario 2 should be given preference over Scenario 1. However, implementation of either option must involve a degree of flexibility by including an appropriate viability clause to permit a range of 'allowable solutions' to be available to developers where targets can be shown to be unfeasible. In line with Government guidelines, targets should be set using the Code for Sustainable Homes rather than any other criteria, although it should be clear whether the requirement refers to the CO2 emission standards in the Code, or to the whole scope of the Code.

Similar stepped targets should be set for non-residential development, but in terms of BREEAM standards. These targets should be equally challenging, but should be subject to review once the outcomes from the Government's consultation on the Code for Sustainable Buildings are known. Experience from London strongly suggests that policies should include: (1) an explicit energy hierarchy; (2) a requirement for a Site Energy Strategy/Sustainability Statement to accompany development proposals; (3) an on-site renewable energy target; (4) a heating and cooling hierarchy, and (5) explicit clauses to address feasibility and viability issues.

Consistent with the above recommendation, an on-site renewables policy for new developments should be included. The findings of this study suggest that an on-site renewables policy requiring 20% CO2 emissions applied to total residual emissions after the inclusion of energy efficiency, CHP and communal heating measures is appropriate.

Further consideration should be given to material to be included within Development Control DPDs, such as detailed criteria-based policies, additional details on the required structure and content of Site Energy Strategies submitted as part of a Sustainability Statement accompanying planning applications, and details on any 'allowable solutions' offered to developers. These should include increased flexibility to encourage the development of district heating in the Heat Priority Areas. All targets and standards should be revised and updated periodically as national policy, sustainability best practice and low and zero carbon technologies develop.

Sustainable energy projects

There is a case for a policy setting out a vision for sustainable energy and including key specific projects – heat networks, larger scale renewables, new build applications and retro-fitting. To support this, site and area specific proposals for sustainable energy should be added to the proposed policies and supporting text. These should include reference to identification of 'Heat

Priority Areas' as described in this report, where district heating using CHP/CCHP as part of a citywide network is likely to offer opportunities to set higher standards in an earlier phases and so should be encouraged/required.

Sustainable design and construction

Although the focus of this study concerns sustainable energy, the broader scope of environmental benefits resulting from sustainable design and construction also needs to be considered. Areas such as water use, the life cycle of materials, biodiversity, waste recycling and sustainable drainage systems are covered within the Code for Sustainable Homes and BREEAM, so unless otherwise specified, the use of these standards to express CO2 emissions targets will also imply certain standards for other aspects of sustainable design and construction. It is recommended that a policy on sustainable design and construction is expressed using these standards alongside a general checklist to highlight the main areas of focus. The viability of Code level 6 should be reviewed following the Government's consultation on the definition of zero carbon homes.

Energy strategy priorities

Bristol City Council should focus its energy strategy on developing the key resources of waste and biomass (woodfuel) to supply larger scale heat or CHP/CCHP plants serving what should ultimately be a citywide district heat network in the city's Heat Priority Areas. These resources, and to a lesser extent gas-fired CHP, have the potential to play a key role in meeting the challenging targets up to and beyond 2016, and could be instrumental in achieving substantial citywide emissions reduction targets in line with those recommended above. As an urban area, Bristol's woodfuel resource is constrained and it should therefore build on existing experience in sourcing woodfuel and encourage the development of local fuel supply chains from outside the city.

Bristol City Council as delivery partner

The strategic position within the community held by Bristol City Council provides an opportunity to facilitate multi-sector partnerships – especially for large scale mixed-use developments, where renewable energy infrastructure may be shared, or where Energy Service Companies (ESCos) may be involved to potentially reduce the additional capital cost burden.

Bristol City Council forms part of the West of England group of local authorities and hence should consider working alongside North Somerset Council, South Gloucestershire Council and Bath and North East Somerset Council in regard of opportunities for sustainable energy. This is already occurring with waste management through the identification of sites incorporating energy recovery from waste but could also include assessing the opportunities for biomass supply chains and sustainable energy supply strategies for cross-boundary urban extensions

Avonmouth

Due to its predominantly industrial land use and excellent transport connections, the Avonmouth area holds significant potential for large scale low or zero carbon energy generation such as wind and biomass plant. A more detailed local study on building energy use in the area and local heat and power demands is suggested to evaluate the potential for CHP/CCHP plant possibly powered

by biomass. It is unlikely that connection to City Centre heat loads would be economic in the short term, although this could emerge in the longer term as a citywide heat network develops. Avonmouth's wind power resource should continue to be developed as far as possible.

District Heating

A strategic planning study on a citywide heat distribution network should be undertaken as soon as possible. The initial phase of a network is likely to be kick-started by a major new development with opportunities for a CHP/CCHP plant site – such as the proposed redevelopment of Southmead Hospital – and should also involve the provision of heat to nearby existing development, most likely within the Heat Priority Area. The study should also assess operational and delivery issues and the potential for ESCO partnerships, learning lessons from recent experience and current practice in London, where the London Development Agency is setting an ambitious agenda for the development of 'Energy Masterplans' for all London boroughs.

Cost of the project
Cost of study – £25,000/30.000€

Energy savings & other sustainable achievements
The research informed the development of climate change and sustainable energy policies in Bristol's Local Plan and the development of the associated sustainable energy projects and initiatives in the city.

➢**MS 5- I-SARE**

Initial Date	30/06/2012	**End of submission date**	Ongoing

Participant name	Fomento San Sebastián - Council of San Sebastián - GAIA -IK4 - JEMA - Diputación Foral de Gipuzkoa
E-mail	Ana_Aizpuru@donostia.org
Field	Micro grid

☐ ICT´s ☐Mobility ☐Energy efficiency

Initiative number	25

Initiative Title (Only public or public-private initiatives)

I-sare

Location Map

The project will be located in Enertic building in Poligono 27 near the districts of Txomin, Martutene and Loiola in Donostia-San Sebastián.

Initiative objectives
The goal of the project is to create an intelligent micro-grid efficient, sustainable and safe that will serve as laboratory for development and experimentation of different new technologies in power generation and storage. This project will allow Basque companies to be in the forefront of micro grids technologies as the future in the power distribution sector. The use of the micro-grid will allow developing analysis on new technologies and the possibility of preparing new projects. This initiative may become a lighthouse project under the new European Funding Framework in Horizon 2020.

Initiative description: target areas, technologies
The intelligent micro-grid is a two direction generation system that allows the electricity distribution from Suppliers to Customers, using digital technology, favouring the integration of generation renewable sources, with the aim of saving energy, reducing costs and increase reliability. The main elements of the micro-grid will be: Energy generation system: Different type of energy generation systems will be implemented. A) Wind turbines with horizontal axis of 10 kW and with vertical axis of 10 kW, B) Photovoltaic panels with 2 units of 20 kW with different type of sun cells, so that comparisons on the performance of each technology, C) Cogeneration group with a micro turbine or gas engine of 50 kW electric and 100 kW thermic, D) Diesel generator to supply electricity in the places where there is not power supply, E) Fuel cell to produce electricity by electrochemistry using Hydrogen as fuel. Storage systems: Also different type of mechanism and/or devices will be studied. A) Batteries able to storage big amount of energy, providing sustainability to the system during periods of prolonged time (hours). B) Flywheel to storage and management of energy in the form of kinetic energy. C) Supercapacitors which principal virtue is to supply high current chargers, without maintenance. They will present fast loading capacity and optimal features to operate under cyclic regimens. All of that under adverse climate conditions. Distribution systems: Two intelligent transformers that adapt to the needs of the micro-grid, reducing losses, improving refrigeration, reducing size and increasing their monitoring level. The intelligence of the system: A) Communication interoperability infrastructure, B) Control center with reasoning capacity and autonomous decision as well as predictive actions capacity. C) Recharge points for electric cars through small energy centers with the capacity of absorb energy while charging or supply energy in precise moments. D) Intelligent meters to adapt in real time the demand and the supply of the energy. This will be the only micro-grid of 400 kW in Spain with a subgrid connected to the main grid. It

will provide the opportunity to design, develop and test new advanced systems for intelligent grids.

It will also be an interactive platform in which the operation of grids and the importance of energy conscience can be taught. A laboratory able to test and make equivalent new solutions. And thus, create new products and solutions with a direct impact in new projects, new companies and more employment.

The micro-grid will be installed in Enertic building to take advantage of synergies and collaboration possibilities with companies hosted in the Center. At least 12 companies and research centers will participate. Among others: Gaia, IK4, Jema, Cegasa, ElectroAz, Ingesea, Oasa transformadores, Ceic, Cidetec and Tekniker. Together with Fomento San Sebastián, Government of the Gipuzkoa Province and the Council of San Sebastián in the "public" side.

Starting year-Duration

The project is ongoing. It will be installed once the Enertic building has been refurbished conveniently around March – April 2014. Once all equipment is in place all activities will start.

It is expected that first experimentations will start around mid-summer 2014 for at least 5 years depending on demand, market conditions and requirements and funding possibilities.

Current situation

The project is pending the finalization of the construction phase of the Enertic building. In the meantime different activities among partners have been shared. Including a selection of analysis to be develop, functional needs of the system and opportunity spaces that can be considered. And also the possibility of commercialization of this solution in European and international markets.

Key Performance Indicators

No yet defined.

Key stakeholders

Main stakeholders in the project are Gaia (ICT cluster) and IK4 (R+D+I Center) as promoters, and JEMA as technology partner. Rest of companies and organizations are participating as partners in specific areas. Institutional partners are also Fomento San Sebastián, the Council of San Sebastián and the Government of the Province of Gipuzkoa.

Lessons learnt

Environmental concerns are the motivational factor used most in the installation of micro-grids together with the reduction of/control over electricity bills. However smart grids present uncertainty as well as risk.

The project aims to install and act as a research facility. Therefore it will foresee the possibility of standardization of processes as a key to expansion and commercialization. Proven technologies will be the base to expand the use of micro-grids for domestic and industrial use. The laboratory will provide information on the type of technologies with better performance in different situations and it will be possible to test different systems for recharging electric cars. It would be interesting to use electric cars as storage units able to supply electricity when needed.

Cost of the project

Site adaptation is expected to cost 315.000€ plus the installation of equipment 389.000€, for a total of 704.000€. It must be added around 200.000€ for the rent of the space during the first 5 years.

The funding will be provided partly by Fomento San Sebastián and the companies from the partnership as well as by the Government of the Province of Gipuzkoa. The project will also be presented to European calls to obtain further funding.

Energy savings & other sustainable achievements

The test of different technologies will start a process of experimentation with renewable energies, intelligent grids and storage possibilities that will lead energy savings when implemented at domestic or industrial level. The unit will act as research facility letting local companies to experiment and try different technologies. They will be able to adequate their equipment and solutions with a full cycle approach.

The implementation of any project derived from this laboratory will have a direct effect on energy savings and reduction of CO_2 emissions. Either by using renewable energies in the generation or by being more efficient in the use and consumption of energy.

6. INTERNATIONAL GOOD PRACTICES

In March 2007, EU leaders set the targets known as "20-20-20" when they committed Europe to become a highly energy-efficient, low carbon economy. This framework integrates different policy goals such as securing energy supply, reducing CO_2 emissions and supporting growth, competitiveness and jobs through a high technology, cost effective and resource efficient approach. A broad set of Union financial instruments will support achieving these goals as well as the Strategic Energy Technology Plan (the SET – Plan). This will also be complemented by the Energy 2020 Strategy which assesses the challenges and measures to ensure a competitive, sustainable and secure energy system. The goals are:

- The 20% GHG reduction target by 2020 compared to 1990. It must be said that in 2011 GHG emissions were estimated at 16% below 1990 levels.
- The 20% renewable energy in gross final energy consumption. The share in 2010 was 12,7% with an annual growth of 4,5% per year that needs to reach an average of 6,3% per annum to reach the target in 2020.
- Reduction of 20% of primary energy consumption compared to projection made in 2007 for 2020. The adoption of the Energy Efficiency Directive (EED) in 2012 gave a comprehensive legislative framework at EU level. The Commission indicates that with current policies this target will not be met in 2020.

Since 2009-2010 implementing measures have been adopted under the Ecodesign and Energy Labelling Directives. The aim is to reduce the energy demand of industrial and households leading to savings for landlords and end-users. The EU also adopted a revised Energy Performance of Buildings Directive (EPBD) in 2010 for heating and cooling systems in the building stock. The Directive requires ensuring that by 2021 all new buildings are "nearly zero-energy buildings". In the transport sector the EU also established performance standards in the fleet average CO_2 emissions of new cars from 172 g per kilometre in 2000 to 135,7 g per kilometre in 2011.

There is another important stream for the EU related to the security of supply and affordability of energy in the internal energy market. Advanced grid connections, regulations in Trans-European Energy Infrastructures and ensuring true interconnection to enhanced security of supply is a must.

By 2050 almost 80% of the population in Europe will be living in cities. Therefore these will play an important role in achieving the mentioned targets. Although sometimes with conflicting policies and procedures, municipal role must lead regulation affecting energy and climate issues. Policies at local level, adequately aligned with regional, national and European policies, must provide an adequate framework for the development of a Smart City Plan with these targets in mind.

A general framework has been provided by the Covenant of Majors to endorse and support the efforts deployed by local authorities in the implementation of sustainable energy policies. The main tool is the preparation of a Sustainable Energy Action Plan outlining key actions to achieve the "20-20-20" goal. The signatories also provide an excellent benchmark of best practices submitted by cities and the catalogue of Sustainable Energy Action Plans is another source of information to take in mind when preparing a Smart Plan for the city.

The idea of this chapter is to collect information and references on current energy planning tools and methodologies that help cities in their Smart City Planning process. The information gathered in only orientative and must be read as examples based on good practices in Europe and internationally. ***But….***

What are "best practices" and what is their value for the construction of the best cities of the future?

Action or set of actions product of the identification of a need that are:

- **Systematic**
- **Effective**
- **Efficient**
- **Sustainable**
- **Flexible**
- Thought and realized by the members of an organization by the **support of his organs of direction** (in the case of cities, their Local Governments (City Councils))
- Beside **satisfying the needs and expectations** of his clients (citizens)
- Suppose an **evident improvement of the standards of the service**
- These good practices **must be documented** to been used as model to others and to facilitate the improvement of the processes themselves.

Best practices are real activities (not intentions). The typology of the facts (actions) could be very diverse but they are characterized because the possibility of being exposed to others, showing evidences and for being relevant towards an objective.

The good practice will be fruit of the evaluation and detection of a condition with expectation of improvement. This evaluation or detection will be able to have been

realized across systems or processes promoted by the entity or will be able to be a result of the investigations, if relevant and reliable, form the stakeholders.

There are not "one day" actions. They are continuously developed with the control of their efficiency. They have to show an evident improvement of the standards of the service, that is to say, a good practice is more than what by regulation has to cover a service for the legal or regulated existing specifications. It has to be a significant advance in this respect.

The good practice has to be coherent and consistent with the mission, vision and values of the organization in the one that takes place and with the mission, vision and values of the associative movement.

The dissemination of best practices is an essential sense of the good practice; therefore it must be documented, so that one could move the knowledge easily to another organization to learn from it.

What is a "best practice" on energy efficient urban planning?

Setting strategies with the objective of improving energy efficiency in buildings or urban spaces, require specialized technical assessment, and strong knowledge about available technologies, legal and political framework and the alternatives offered by markets, as well as financing facilities access.

High energy efficiency districts and cities will refer to the whole system developed through:

a) New and Innovative generation system.

b) Advanced Electrical and thermal storage systems and thermal energy recovery systems from waste water and ventilation.

c) Integration and Interaction of the systems: building to building and building to grid.

d) Improved methodologies for interconnectivity of smart grids and heating and cooling networks.

e) Energy management system at district level.

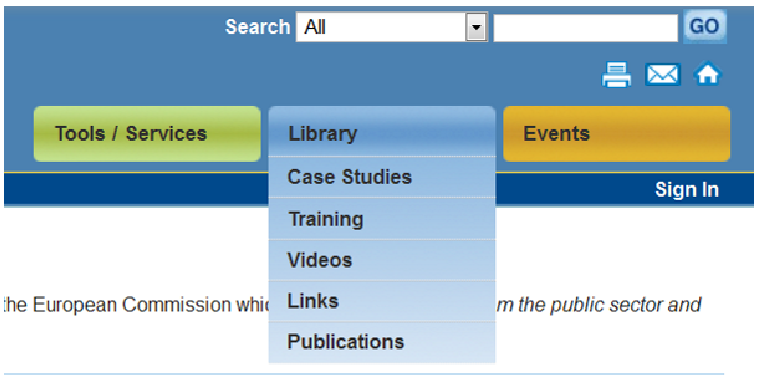
Policies implemented by city governments affect the economic, environmental and social conditions within the city so it is imperative that those policies are effective and suited to the particular city.

It is important that the criteria used to define best practice take into account the broad implications of policy (Jollands and Kenihan, 1996). There have recently been a number of other projects that share the specific objective of identifying best practice's energy efficiency programs in cities. These other projects include some like: the Good Practice on Local Energy Action (European Commission Directorate General for Energy and

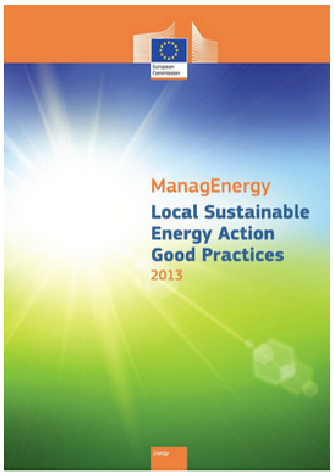
Transport, ManagEnergy Initiative), the European Green Cities Network (EGCN) or the CONCERTO Program, at European level, and like Energy Sector Management Assistance Program (ESMAP) or UN-Habitat Best Practices, at world global level.

European data bases of energy efficiency best practices:

ManagEnergy is a technical support initiative of the Intelligent Energy – Europe (IEE) programme of the European Commission which aims to assist actors from the public sector and their advisers working on energy efficiency and renewable energy at the local and regional level. A major objective of ManagEnergy is to facilitate information and experience exchange between local and regional energy actors in different parts of Europe. ManagEnergy promotes good practice case studies, namely projects that have demonstrated positive results in the fields of energy efficiency, renewable energy and clean transport and have the potential to be replicated. Good practice case studies make a clear contribution to sustainable development, have a positive impact and demonstrate a high replication potential.	http://www.managenergy.net/



Good practices are compiled in an Annual Brochure and reported as articles:



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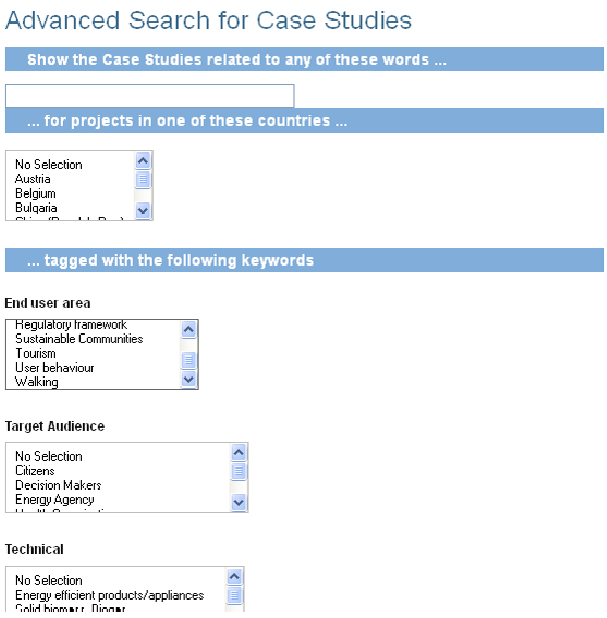
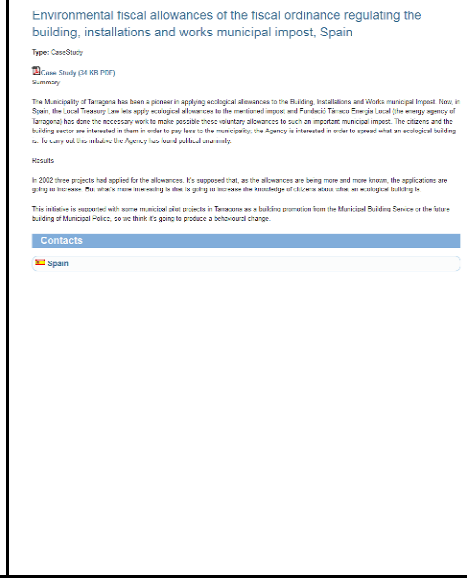
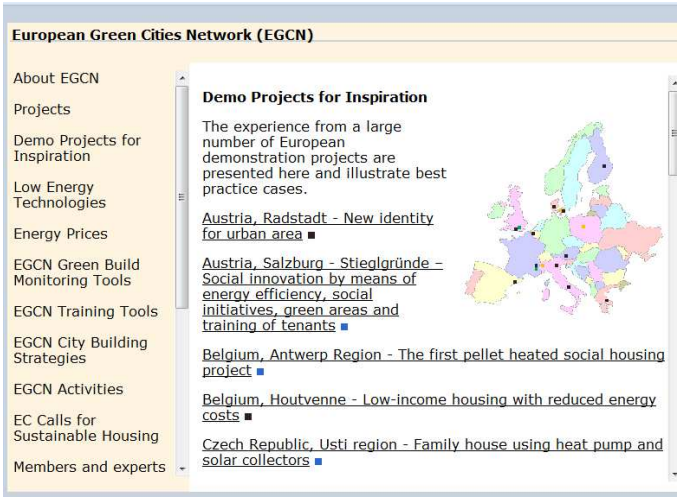




The European Green Cities Network (EGCN) was started up in 1996 in connection to EU Thermie project European Green Cities – as a forum for dissemination of Sustainable Urban Housing initiatives and good examples. The network will disseminate knowledge and experiences regarding sustainable urban housing technologies in order to stimulate market development and help speed up innovation. The experience from the 11 demonstration projects in the European Green Cities project, as well as the demonstration projects under the Green Housing Block and Green Solar Region are selected as the first projects to be disseminated through the EGCN homepage. Descriptions of the projects are located under the menu "demo projects for inspiration". All projects aim to start an urban ecology management process as part of the European Green Cities cooperation.  	http://europeangreencities.com

- Experience from the following demonstration projects and networks will be disseminated through the EGCN:

European Green Cities (EGC)

Green Solar Regions (GSR)

Green Housing Block (GHB)

Green City Building

SECURE

MUSEC

ENPIRE

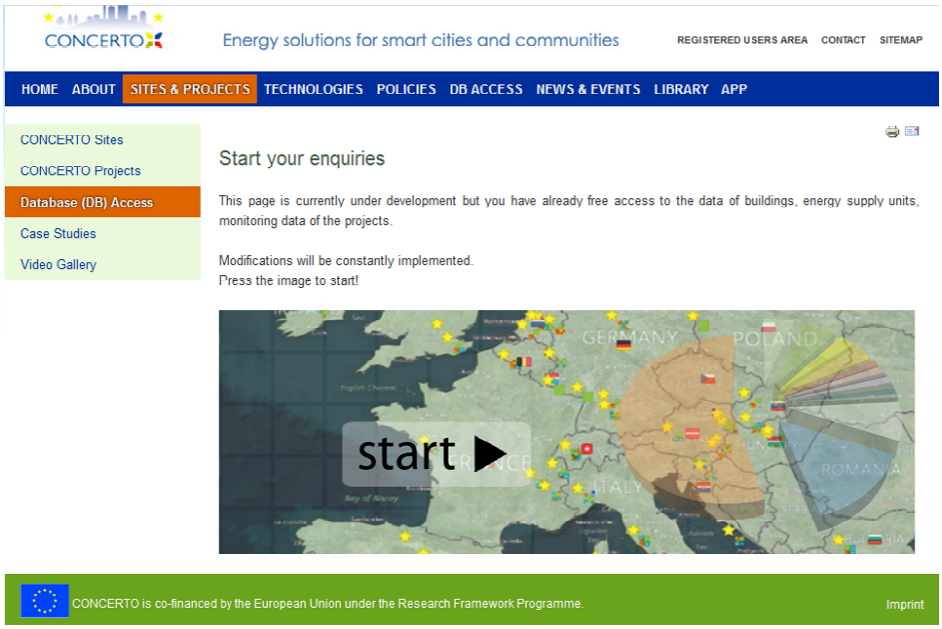
Green Solar Cities

European Housing Ecology Network (EHEN)

Practical Recommendations for Sustainable Construction (PRESCO)

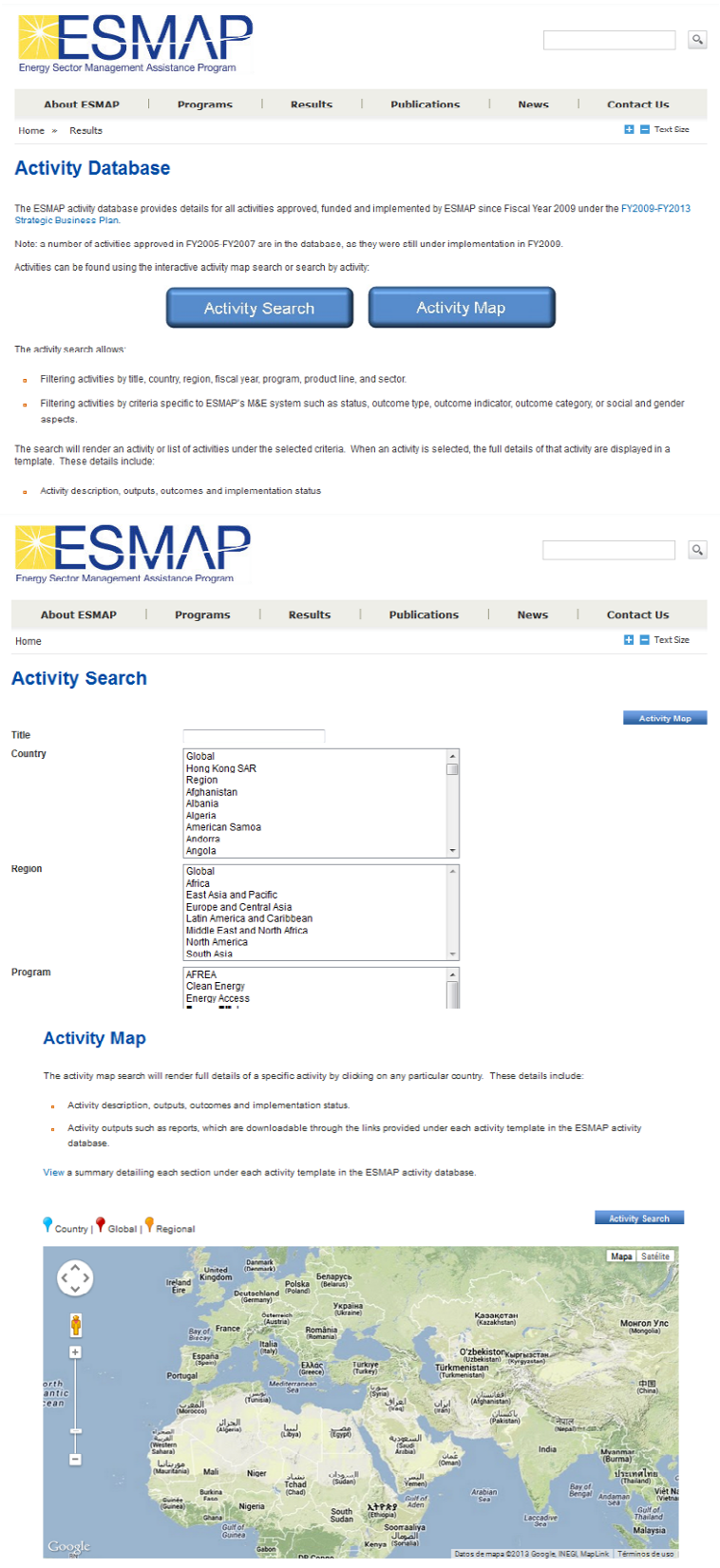
CONCERTO is a European Commission initiative within the European Research Framework Programme (FP6 and FP7). Responding to the facts that buildings account for 40 % of total energy consumption in the Union, for 33% of CO2 emissions and that 70% of the EU's energy consumption and a similar share of GHG emission take place in cities, with a huge untappted potential for cost-effective energy savings, it aims to demonstrate that the energy-optimisation of districts and communities as a whole is more cost-effective than optimising each building individually, if all relevant stakeholders work together and integrate different energy-technologies in a smart way. The EU initiative under of the European Commission's Directorate General for Energy started in 2005 and has co-funded with more than 175 Million € 58 cities and communities in 22 projects in 23 countries. CONCERTO demonstrates implemented examples of: ➢ innovative technologies that are ready to be applied ➢ the use of renewable energies sources for cities ➢ energy efficiency measures ➢ sustainable building and district development ➢ economic assessments ➢ affordable energy ➢ energy transparency for citizens The CONCERTO initiative proves that if given the right planning, cities and communities can be transformed into pioneers in energy efficiency and sustainability. The results so far have been very encouraging: CONCERTO cities and communities have shown that existing buildings can cut their CO2 **emissions**, at acceptable costs, by up to 50%. CONCERTO does this by implementing renewable energy sources, innovative technologies and an integrated approach. The 58 CONCERTO cities and communities integrate innovative energy efficiency measures with a substantial contribution from local renewable energy sources (RES), smart grids, renewables-based cogeneration, district heating/cooling systems and energy management systems in larger building settlements. These sets of innovative	http://www.concerto.eu

technologies and measures are optimised locally in order to take into account the specific characteristics and possibilities of the local site, climate and cultural differences or local political aspects. CONCERTO cities and communities demonstrate role-models towards zero energy communities. The experiences and technology performance data from the CONCERTO sites have been thoroughly gathered and analysed in the meta-projects CONCERTO Plus and CONCERTO Premium. The results are made available on this website; in reports and via the interactive technical monitoring database with intelligent inquiry facility. Recommendations for practitioners and policy makers based on the lessons learned in CONCERTO are particularly relevant for the Smart Cities and Communities European Innovation Partnership, which addresses the challenge of making entire cities energy-smart. The CONCERTO shows cities and communities how to make their energy-systems fit for the future. It helps the EU reaching its objectives of saving 20% of its primary energy consumption and cutting its greenhouse gas emissions by 20% by 2020, and by 80-95% by 2050 (compared to 1990 levels).	



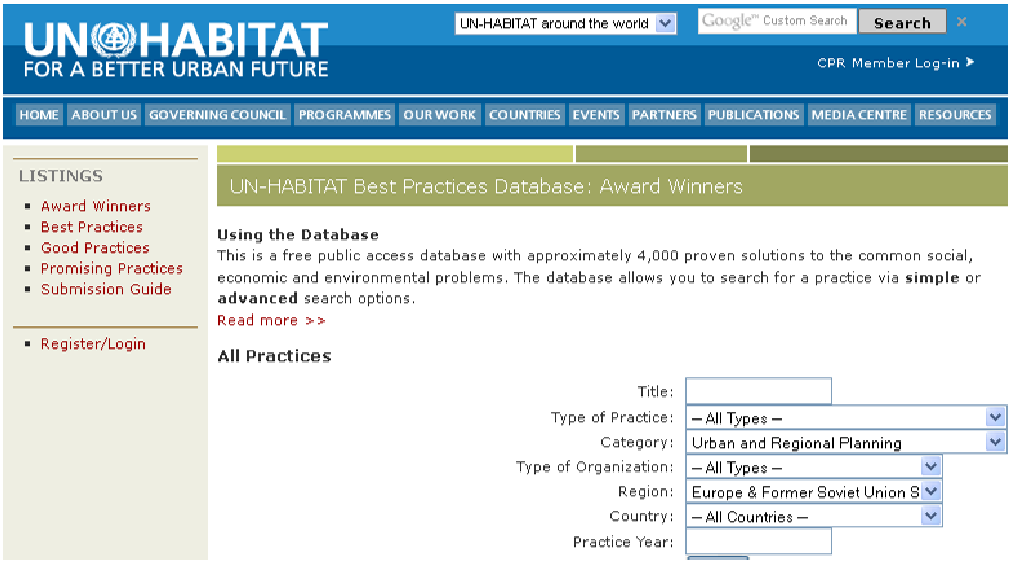
Global data bases of energy efficiency best practices:

The **Energy Sector Management Assistance Program (ESMAP)** is a global knowledge and technical assistance program administered by the World Bank. Its mission is to assist low- and middle-income countries to increase know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. Focus areas: Energy Security To help ensure long-term energy security, countries are looking closely at renewable energy, efficiency practices and technologies, diversification of supply, and improved sector performance. ESMAP assists its clients to carry out energy assessments and develop strategies to enhance sector planning, regulation, and governance. Energy Access About 1.4 billion of the world's people still lack access to electricity, and poor households spend US$20 billion a year on low-quality, fuel-based lighting. Respiratory diseases are widespread among the 2.7 billion people who still rely on biomass for cooking, with women and children hit the hardest. ESMAP supports initiatives to reduce energy poverty by expanding access to modern, safe, affordable and sustainable energy services. ESMAP's energy access work covers electrification and household energy needs in rural areas and for the urban poor. Climate Change Climate change will directly affect energy resource endowments, infrastructure, and transportation, as well as energy demand. ESMAP assists client countries to integrate climate change mitigation and adaptation options into energy sector planning. ESMAP also supports the scale-up of renewable energy through resource assessments, strategy development, and policy and institutional development.	http://www.esmap.org


ESMAP
Energy Sector Management Assistance Program
About ESMAP | Programs | Results | Publications | News | Contact Us
Home » Results
Text Size
Activity Database
The ESMAP activity database provides details for all activities approved, funded and implemented by ESMAP since Fiscal Year 2009 under the FY2009-FY2013 Strategic Business Plan.
Note: a number of activities approved in FY2005-FY2007 are in the database, as they were still under implementation in FY2009.
Activities can be found using the interactive activity map search or search by activity:
Activity Search
Activity Map
The activity search allows:
Filtering activities by title, country, region, fiscal year, program, product line, and sector.
Filtering activities by criteria specific to ESMAP's M&E system such as status, outcome type, outcome indicator, outcome category, or social and gender aspects.
The search will render an activity or list of activities under the selected criteria. When an activity is selected, the full details of that activity are displayed in a template. These details include:
Activity description, outputs, outcomes and implementation status
ESMAP
Energy Sector Management Assistance Program
About ESMAP | Programs | Results | Publications | News | Contact Us
Home
Text Size
Activity Search
Activity Map
Title
Country
Global
Hong Kong SAR
Region
Afghanistan
Albania
Algeria
American Samoa
Andorra
Angola
Region
Global
Africa
East Asia and Pacific
Europe and Central Asia
Latin America and Caribbean
Middle East and North Africa
North America
South Asia
Program
AFREA
Clean Energy
Energy Access
Activity Map
The activity map search will render full details of a specific activity by clicking on any particular country. These details include:
Activity description, outputs, outcomes and implementation status.
Activity outputs such as reports, which are downloadable through the links provided under each activity template in the ESMAP activity database.
View a summary detailing each section under each activity template in the ESMAP activity database.
Country | Global | Regional
Activity Search
Mapa
Satélite
Google

UN-HABITAT PROGRAM The Best Practices and Local Leadership Program (BLP) was established in 1997 in response to the call of the Habitat Agenda to make use of information and networking in support of its implementation. It is a global network of government agencies, local authorities and their associations, professional and academic institutions and grassroots organizations dedicated to the identification and exchange of best practices for sustainable development. Best Practices are actions that have made a lasting contribution to improving the quality of life and the sustainability of cities and communities. The Program's partners are specialized in such areas as housing and urban development, urban governance, environmental planning and management, architecture and urban design, economic development, social inclusion, crime prevention, poverty reduction, women, youth, cultural heritage, municipal finance and management, infrastructure and social services. **Objectives**: The objective of the Program is to raise awareness of decision-makers on critical social, economic and environmental issues and to better inform them of the practical means and policy options for improving the living environment. It does so by identifying, disseminating and applying lessons learned from Best Practices to ongoing training, leadership and policy development activities. **BLP Products**: The key products of the Program include documented and peer-reviewed best practices, examples of good policies and enabling legislation, case studies and briefs, and transfer methodologies. These products are available for use globally through an online Best Practices Database, which to date contains over 4,000 proven solutions to common social, economic and environmental problems from 140 countries. **Key Clients served**: The main clients of the Program include decision-makers, practicing professionals at all	http://www.unhabitat.org

levels of government and the private sector, civil society as well as the general public.	



Other important information source for the STEEP project are the ongoing European projects around the concept of Smart Cities and Urban Metabolisms Approach and related to STEEP Project objectives:

GREEN SURGE Green Infrastructure and Urban Biodiversity for Sustainable Urban Development and the Green Economy http://cordis.europa.eu/projects/rcn/110888_en.html http://eusoils.jrc.ec.europa.eu/projects/Eufunded/Land_Soil_Desertification_Community_2013/Project_Presentations/GREEN_SURGE_presentation.pdf	BRIDGE Sustainable urban planning decision support accounting for urban metabolism http://cordis.europa.eu/projects/rcn/88630_en.html http://www.bridge-fp7.eu/
ECODISTR-ICT Integrated decision support tool for retrofit and renewal towards sustainable districts http://cordis.europa.eu/projects/rcn/110	TRUST Transitions to the Urban Water Services of Tomorrow http://cordis.europa.eu/projects/rcn/98683_en.html

674_en.html	
PRIMUS Policies and research for an integrated management of urban sustainability http://cordis.europa.eu/projects/rcn/90973_en.html http://zenodo.org/record/1060#.Uoy6cidJQro	SUME Sustainable urban metabolism for Europe http://cordis.europa.eu/projects/rcn/88558_en.html

Other Planning Tools and Methodologies:

European Energy Award®

The European Energy Award® is a programme for planning and realising energy and climate protection policy goals and measures in municipalities. Acting as a quality management system and certification process, the European Energy Award® establishes interdisciplinary planning and action as well as a process-oriented and long-term energy and climate protection policy in municipalities.

Using the European Energy Award® all municipal energy and climate protection activities are systematically determined, assessed, continually checked, co-ordinated and precisely implemented.

A Europe-wide network of experts and regular exchange of information guarantees municipalities access to current, specific know-how.

External certification with subsequent awards is an integral component of the European Energy Award®. During the process of such a certification, the successes accomplished through energy and climate protection activities in a given municipality are checked by an external eea auditor.

The European Energy Award® is awarded if the eea auditor confirms that the defined standards and at least 50% of the points have been met.

If 75% of the points have been reached and an international certification process has been carried out, the European Energy Award® Gold is awarded.
As part of the award, the successes are officially documented and publicly recognised; the municipality's role as a model of energy efficiency and climate protection is also boosted and specific location marketing is done for the municipality.

More info at http://european-energy-award.org

e5-programme for energy-efficient communities

e5 is an energy efficiency and climate protection programme successfully acting on local level. It is a certification and quality management system for communities enabling participants to improve their communal energy efficiency and to increase the utilisation of renewable energy. e5 consists of a quality management system for communal energy-related services and activities as well as certification and award for energy-related achievements.

The target of the e5 programme is the identification of energy saving potentials within a community and the realisation, documentation and evaluation of the saving measures. Therefore a communal action programme is developed and adapted annually. All energy-related fields of municipalities (six energy areas: development & spatial planning, buildings & facilities, mobility, energy supply & disposal, internal organisation, communication & co-operation) are considered. Internal structures, suitable for steering the process including all relevant players in the community (politics, administration, citizens, enterprises etc.) are set up.

The best communities achieve up to “eeeee”, corresponding to 75 % of all possible energy measures. e5 correlates with the European system European Energy Award®. The Austrian certification "eee" (50 % of all possible points) is the equivalent of the European Energy Award® and the level “eeeee” corresponds to the European Energy Award® Gold. The European Energy Award® Gold can be seen as the European Champion League of energy efficiency.

More infor at http://www.e5-salzburg.at

Cité de l’Enérgie

This label provides evidence for the municipalities that are actively working with a sustainable energy policy. It promotes the use of renewable energy, sustainable mobility for the environment and implements sustainable management of resources. It is awarded by the independent commission of the city Association of energy. There are about 345 Cities of energy being 24 of them awarded with the European Energy Award GOLD.

This is not only a brand name for marketing a city but a global process leading cities through various stages towards the award of the label. To get there, a municipality must have a Plan with actions in six areas of energy policy: 1)Land-use planning, construction; 2) Buildings and municipal facilities; 3) Supply and remediation; 4) Mobility; 5)Internal organization and 6) Communication and Cooperation. The municipalities that implement more than 75% of the measures receive the GOLD award.

More info at http://www.citedelenergie.ch

BREEAM

This is the world's foremost environmental assessment method and rating system for buildings, with 250,000 buildings with certified BREEAM assessment ratings and over a million registered for assessment since it was first launched in 1990.

BREEAM sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance. It encourages designers, clients and others to think about low carbon and low impact design, minimising the energy demands created by a building before considering energy efficiency and low carbon technologies.

A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes.

Local planning authorities (LPAs) can include appropriate sustainable construction policies in their local plans to provide more certainty for both planners and developers. A growing number of local authorities are specifying BREEAM in their Local Plans. As of January 2013, all local planning authorities in Wales, and around 55% of those in England, required development to meet standards in the Code for Sustainable Homes and/or BREEAM in local plans which were adopted or at an advanced stage of preparation. For instance the case of Bristol City Council who by policy BCS15 related to sustainable design and construction requires in the case of major developments for health or education uses the BREEAM and/or Code for Sustainable Homes assessment. From 2016 residential development will be expected to meet Level 6 of the Code for Sustainable Homes. For non-residential development also from 2016 a BREEAM "excellent" rating will be expected.

More info at http://www.breeam.org

The case of Bristol http://www.bristol.gov.uk/page/planning-and-building-regulations/planning-core-strategy

PASSIVE HOUSE Standards

This is a standard that seeks energy efficiency while considering comfortability and affordability at the same time. It is a construction concept that can be applied by anyone, anywhere. The main features to consider are:

- Passive Houses allow for space heating and cooling related energy savings of up to 90% compared with typical building stock and over 75% compared to average new builds. Passive Houses use less than 1.5 l of oil or 1.5 m3 of gas to heat one square meter of living space for a year – substantially less than common "low-energy" buildings. Vast energy savings have been demonstrated in warm climates where typical buildings also require active cooling.
- Passive Houses make efficient use of the sun, internal heat sources and heat recovery, rendering conventional heating systems unnecessary throughout even the coldest of winters. During warmer months, Passive Houses make use of passive cooling techniques such as strategic shading to keep comfortably cool.
- Passive Houses are praised for the high level of comfort they offer. Internal surface temperatures vary little from indoor air temperatures, even in the face of extreme outdoor temperatures. Special windows and a building envelope consisting of a highly insulated roof and floor slab as well as highly insulated exterior walls keep the desired warmth in the house – or undesirable heat out.
- A ventilation system imperceptibly supplies constant fresh air, making for superior air quality without unpleasant draughts. A highly efficient heat recovery unit allows for the heat contained in the exhaust air to be re-used.

More info at http://passiv.de/en/

7. CONCLUSIONS

After the analysis of the submitted templates some conclusions can be deduced about the different policies developed in these three cities. To be mentioned the work done by all of them, regarding the dissemination actions towards a better awareness of the citizens on the subject of energy efficiency, ICT's, renewable energy, sustainable mobility and reduction of energy demand.

Each city adapts the strategies to the different territories or the specific problems. Bristol, for instance, uses its citizens to spread real life good practices. The citizens influence the energy policies of their neighbours. With a highly ellaborated strategy, the energy poverty of the people at risk of social exclusion tries to be avoided by better consumption habits.

On the other hand, the need for data collection and knowledge of the real functioning of the passive and active elements is a very important factor, repeated in several ICT and energy efficiency projects, such as renewable energy or changes of building enclosures.

These three cities of the STEEP project share the main goals, that is, to achieve the 20/20/20 objectives mentioned in the covenant of mayors. At this respect, Bristol has a more ambitious target on emission reduction. Bristol's reduction target is 40%. Each city prioritizes the fields of action to achieve these targets.

Bristol uses ICT's combined with different kinds of renewable energies, reduces emissions by acting on the regulation, information systems and control of the energy production installations.

San Sebastián acts on the passive and active building systems with a local policy and supports the progressive implementation of renewable energy installations.

Florence, having the same objectives, develops a different alternative for the sustainable mobility issue which collapses the city. Florence also tries to find an alternative to the approval of new land development by re-densifying the city where energy demand reduction is expected.